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Subject: **Final Phase 2 PFCs Site Investigation Work Plan  
Tucson Air National Guard Base, Tucson, Arizona**  
Contract No. W9133L-14-D-0001, TO 0007  
AECOM Project Number: 60520893

Mr. Ellett,

Please find an electronic copy of the Site Investigation Work Plan for the above referenced installation. Please contact me at (301) 820-3246 or via e-mail ([mike.myers@aecom.com](mailto:mike.myers@aecom.com)) if you have any questions or comments.

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# Work Plan for the Phase 2 Regional Site Inspections for Perfluorinated Compounds

Tucson Air National Guard Base  
Tucson, Arizona

NGB/A4OR

Contract No. W9133L-14-D-0001, Task Order No. 0007

October 10, 2017

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## List of Acronyms and Abbreviations

ADEQ	Arizona Department of Environmental Quality
AFFF	Aqueous Film Forming Foams
ANG	Air National Guard
ANGB	Air National Guard Base
APP	Accident Prevention Plan
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COPC	Contaminants of Potential Concern
CPR	Cardiopulmonary resuscitation
CSM	Conceptual Site Model
DoD	Department of Defense
DQO	Data Quality Objective
EB	Equipment Blank
ECF	electrochemical fluorination
ELAP	Environmental Laboratory Approval Program
ERPIMS	Environmental Resources Program Information Management System
FD	Fire Department
ft	feet
FRB	Field Reagent Blank
FS	Feasibility Study
FSS	Fire Suppression System
FTA	Fire Training Area
GIS	Geographic Information System
HA	Health Advisory
HAZWOPER	Hazardous Waste Operations and Emergency Response
HEF	High Expansion Foam
HDPE	high density polyethylene
HSA	hollow-stem auger
IDW	Investigation Derived Waste
IRP	Installation Restoration Program
Mil-Spec	Military Specification
msl	mean sea level
MW	monitoring well
NFA	No Further Action
NGB/A4OR	National Guard Bureau, Operations Division, Restoration Branch
NFTA	Non-Fire Training Area
NTA	Nozzle Test Area
NRCS	Natural Resources Conservation Service
OBM	Off-Base Migration
OWS	Oil/Water Separator
PA	Preliminary Assessment
PFAA	Perfluoroalkyl acids
PFBS	Perfluorobutane sulfonic acid
PFCs	Perfluorinated Compounds
PFHpA	Perfluoroheptanoic acid
PFHxS	Perfluorohexane sulfonic acid
PFNA	Perfluorononanoic acid
PFOS	Perfluorooctane sulfonic acid
PFOA	Perfluorooctanoic acid
PID	Photoionization Detector
PRL	Potential Release Locations
PVC	Poly-vinyl chloride
QA	Quality Assurance
QAPP	Quality Assurance Project Plan

QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
SAF/IE	Secretary of the Air Force/Installation, Environment and Energy
SB	Soil Boring
SI	Site Investigation
SOP	Standard Operating Procedure
TCE	Trichloroethene
TEGD	Technical Enforcement Guidance Document
UCMR	Unregulated Contaminant Monitoring Rule
USAF	United States Air Force
US EPA	United States Environmental Protection Agency
USCS	Unified Soil Classification System
USDA	United States Department of Agriculture
VOC	Volatile Organic Compound

## Executive Summary

Under contract to the National Guard Bureau, Operations Division, Restoration Branch's (NGB/A4OR), AECOM will conduct a Site Investigation (SI) for Perfluorinated Compounds (PFCs) at the Tucson Air National Guard Base (ANGB), 162<sup>nd</sup> Wing, Tucson County, Tucson, Arizona. The NGB/A4OR's goal for the SI is to determine presence or absence of PFCs in soil or surface water or sediment (if present) at each potential release location (PRL) and in groundwater downgradient of PRLs, and assess if PFC constituents from the base are migrating off site. The Work Plan that follows provides the approach for obtaining the project objectives.

PFCs are compounds used in the formulation of Aqueous Film Forming Foam (AFFF), which was used by the United States Air Force (USAF) and the Air National Guard (ANG) to extinguish petroleum fires starting from approximately 1970. Releases of AFFF to the environment routinely occurred during fire training exercises. In 2016, the United States Environmental Protection Agency (US EPA) issued lifetime drinking water health advisories (HA) for two specific PFCs, Perfluorooctane sulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) (US EPA, 2016a,b). It is the USAF's (and thereby also the ANG's) policy (Secretary of the Air Force/Installation, Environment and Energy [SAF/IE] 8/11/16) to allocate funds for the investigation of potential releases of PFCs, ensure protection of human health and the environment, and address any releases of PFCs that pose an unacceptable risk (Department of Defense [DoD], 2009; Department of the USAF 2012; Department of the USAF, 2014).

A Preliminary Assessment (PA) for PFCs was conducted at Tucson ANGB in 2016 (BB&E, 2016). Based on findings of the PFC PA at the Tucson ANGB, fourteen PRLs have been identified where PFCs may have been released to the environment. These PRLs are listed in **Table ES-1**:

**Table ES-1. PRLs Included in the Tucson ANGB PA**

PA PRL #	Site Description	Recommendation	Rationale
2	Building 50 –Fire Station	Site Investigation	Unused AFFF stored at this location, as well as AFFF in fire trucks. AFFF is filled from containers into fire trucks at this building.
3	Building 35 – Fuel Cell Maintenance and Corrosion Control	Site Investigation	Previously contained an AFFF FSS.
4	IRP Site 5 - Old Washrack Area	Site Investigation	Former washrack for Base vehicles including fire trucks until 1985.
5	Building 12 – Maintenance Hangar	Site Investigation	Only hangar on Base with active AFFF FSS. One known release of AFFF.
6	Building 10 – Maintenance Hangar	Site Investigation	Hangar with former AFFF FSS until 2004/2005.
7	Former Concrete Ramp	Site Investigation	Base personnel recall portions of the ramp being “foamed” with AFFF during fuel spills and one airplane crash circa 1997.
8	Current Concrete Ramp	Site Investigation	Adjacent to Buildings 10 and 12 which had/have AFFF FSS. Any discharges from these buildings would have entered the ramp and flowed into storm drains.
9	Former Nozzle Testing Area	Site Investigation	Nozzle testing on a dirt area with AFFF.
11	Unlined Drainage Ditch	Site Investigation	Receives and conveys stormwater from the western portion of the Base, including the Current Concrete Ramp, the Former Nozzle Testing Area, and Building 35 – Fuel Cell Maintenance and Corrosion Control.
12	Outfall W01	Site Investigation	Receives drainage from the Current Concrete Ramp and the Current Nozzle Testing Area where there has been known AFFF use.
13	Outfall W06	Site Investigation	Receives drainage from Building 50 – Fire Station where AFFF is stored.

PA PRL #	Site Description	Recommendation	Rationale
14	Outfall W10	Site Investigation	Receives drainage from Buildings 10 and 12 (known AFFF use and release), as well as potential releases from Building 9.
15	Outfall W13	Site Investigation	Received drainage from Former Concrete Ramp where there was known AFFF use.
16	Outfall W14	Site Investigation	Received drainage from Former Concrete Ramp where there was known AFFF use.
AFFF – Aqueous Film Forming Foam FSS – Fire Suppression System IRP – Installation Restoration Program			PFC – Perfluorinated Compound PRL – Potential Release Location SI – Site Investigation

For each PRL not considered an outfall, the general technical approach includes three borings with two soil samples collected at each boring and the collection of one groundwater sample from a new or existing monitoring well located in the immediate downgradient direction of groundwater flow from each PRL. For PRLs with larger footprints (such as the Former or Current Concrete Ramp), additional soil and groundwater samples will be collected. Groundwater samples will be collected from three monitoring wells located in the downgradient direction of groundwater flow at the base boundary to fulfill the objective of determining if PFC constituents from the Tucson ANGB are migrating off site. As detailed in the report that follows, the SI will include the collection of soil, sediment, surface water, and groundwater samples at the fourteen PRLs and three base boundary monitoring wells that will be analyzed for six PFC constituents per USAF and ANG guidance. **Table ES-2** summarizes the proposed sampling to be conducted with this SI.

**Table ES-2. Summary of SI Sampling at Tucson ANGB**

Location	Estimated Number of Borings and Monitoring Wells to be Installed	Estimated Depth New Borings (ft bgs)	Number of Samples
Building 50 –Fire Station	3 SB 1 MW*	<b>Soil:</b> 10 <b>MW:</b> 100	<b>Soil:</b> 6 Samples <b>Groundwater:</b> 1 Sample
Building 35 – Fuel Cell Maintenance and Corrosion Control	3 SB 1 MW*	<b>Soil:</b> 10 <b>MW:</b> 100	<b>Soil:</b> 6 Samples <b>Groundwater:</b> 1 Sample
IRP Site 5 - Old Washrack Area	3 SB 1 MW*	<b>Soil:</b> 10 <b>MW:</b> 100	<b>Soil:</b> 6 Samples <b>Groundwater:</b> 1 Sample
Building 12 – Maintenance Hangar	3 SB 1 MW*	<b>Soil:</b> 10 <b>MW:</b> 100	<b>Soil:</b> 6 Samples <b>Groundwater:</b> 1 Sample
Building 10 – Maintenance Hangar	3 SB 1 MW	<b>Soil:</b> 10 <b>MW:</b> 100	<b>Soil:</b> 6 Samples <b>Groundwater:</b> 1 Sample
Former Concrete Ramp	6 SB 4 MW*	<b>Soil:</b> 10 <b>MW:</b> 100	<b>Soil:</b> 12 Samples <b>Groundwater:</b> 4 Samples
Current Concrete Ramp	6 SB 5 MW*	<b>Soil:</b> 10 <b>MW:</b> 100	<b>Soil:</b> 12 Samples <b>Groundwater:</b> 5 Samples
Former Nozzle Testing Area	3 SB 1 MW*	<b>Soil:</b> 10 <b>MW:</b> 100	<b>Soil:</b> 6 Samples <b>Groundwater:</b> 1 Sample
Unlined Drainage Ditch	3 SW 3 SD 1 MW*	<b>Soil:</b> 10 <b>MW:</b> 100	<b>Surface Water:</b> 3 Samples <b>Sediment:</b> 3 Samples <b>Groundwater:</b> 1 Sample
Outfall W01	1 SW 1 SD	NA	<b>Surface Water:</b> 1 Sample <b>Sediment:</b> 1 Sample
Outfall W06	1 SW 1 SD	NA	<b>Surface Water:</b> 1 Sample <b>Sediment:</b> 1 Sample

Location	Estimated Number of Borings and Monitoring Wells to be Installed	Estimated Depth New Borings (ft bgs)	Number of Samples
Outfall W10	1 SW 1 SD	NA	<b>Surface Water:</b> 1 Sample <b>Sediment:</b> 1 Sample
Outfall W13	1 SW 1 SD	NA	<b>Surface Water:</b> 1 Sample <b>Sediment:</b> 1 Sample
Outfall W14	1 SW 1 SD	NA	<b>Surface Water:</b> 1 Sample <b>Sediment:</b> 1 Sample
Base Boundary Wells	3 MW	<b>MW:</b> 100	<b>Groundwater:</b> 3 Samples
SB = Soil Boring; MW = Monitoring Well; NA = Not Applicable; SW = Surface Water; SD = Sediment * Number includes existing monitoring wells or "shared" (between contiguous PRLs) soil borings or wells to be sampled.			

# 1. Introduction

Under contract to National Guard Bureau, Operations Division, Restoration Branch's (NGB/A4OR), AECOM will conduct a Site Investigation (SI) at fourteen potential release locations (PRLs) that have been identified by the Air National Guard (ANG). The SI activities will be conducted to determine presence or absence of perfluorinated compounds (PFCs) in soil, surface water, or sediment at each PRL and in groundwater downgradient of PRLs, and assess if potential PFC constituents from the base are migrating off site. This SI Work Plan addresses the PRLs located on Tucson Air National Guard Base (ANGB). **Figure 1-1** in **Appendix A** provides a general location map for Tucson ANGB.

The SI, which follows the Preliminary Assessment (PA) in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process, is not intended as a full-scale study of the nature and extent of contamination. The United States Environmental Protection Agency (US EPA) identifies the SI as the on-site investigation to determine what hazardous substances are present and if they are being released to the environment. Its purpose is to augment the data collected in the PA and to generate, if necessary, sampling and other field data to determine if further response action or remedial investigation is appropriate.

## 1.1 Scope and Objectives

This SI Work Plan defines the overall project objectives, summarizes the results from the previous PA conducted in 2016, outlines the site history, and presents the investigation tasks that will be conducted to achieve the project objectives. This Work Plan identifies the equipment, methods, and staffing necessary to perform the following tasks:

- For the PRLs that have been identified as requiring additional investigation, incorporate relevant information, as described below, into the SI approach;
- Gather site-specific information to evaluate the fate and transport mechanisms;
- Identify topography, vegetation, soil characteristics, climate, land use at the site and adjacent real estate;
- Evaluate fate and transport mechanisms specifically related to PFCs to determine potential exposure pathways;
- Collect and evaluate soil, sediment, surface water and groundwater samples for PFC constituents utilizing industry best management practices to reduce potential false positives;
- Evaluate if PFCs are migrating off site, and,
- Determine if the concentrations of PFC constituents at each PRL are present in quantities or concentrations that warrant no further action (NFA) or additional investigation as part of the Remedial Investigation (RI)/Feasibility Study (FS) phase, and if so, what the appropriate data quality objectives (DQOs) should be.

Work under this task order will be completed in accordance with applicable and appropriate United States Air Force (USAF) and ANG policies, regulations and guidance, and Federal, State and local laws. Key references and policy documents for this investigation include, but are not limited to, the following:

- Air National Guard Readiness Center. 2009. Air National Guard, Environmental Restoration Program, Investigation Guidance. September.
- US EPA Guidance for Performing Site Inspections Under CERCLA; Interim Final, September 1992 (<http://www.hanford.gov/dqo/project/level5/sicercla.pdf>)
- US EPA Federal Facilities Remedial Site Inspection Summary Guide. July 2005 ([http://www.epa.gov/fedfac/pdf/ff\\_si\\_guide.pdf](http://www.epa.gov/fedfac/pdf/ff_si_guide.pdf))



- Secretary of the Air Force/Installation, Environment and Energy (SAF/IE). Policy on Perfluorinated Compounds. August 11, 2016.
- US EPA, 2016a. Drinking Water Health Advisory for PFOA – May 2016.  
([https://www.epa.gov/sites/production/files/2016-05/documents/pfoa\\_health\\_advisory\\_final\\_508.pdf](https://www.epa.gov/sites/production/files/2016-05/documents/pfoa_health_advisory_final_508.pdf))
- US EPA, 2016b. Drinking Water Health Advisory for PFOS – May 2016.  
([https://www.epa.gov/sites/production/files/2016-05/documents/pfos\\_health\\_advisory\\_final\\_508.pdf](https://www.epa.gov/sites/production/files/2016-05/documents/pfos_health_advisory_final_508.pdf))

PFCs are not federally regulated but are regulated (principally for drinking water) in several states. However, as reflected in USAF Policy (SAF/IE 8/11/16), the USAF and ANG have committed to:

- Allocate funds for the assessment, investigation, mitigation and environmental response to Perfluorooctanesulfonic acid/Perfluorooctanoic acid (PFOS/PFOA) releases, as needed, to ensure the protection of human health and the environment, consistent with applicable Federal or state law;
- Identify all locations on USAF and ANG Installations where potential releases could have occurred and confirm whether there exists a potential unacceptable risk to human health and the environment;
- Address any PFOS/PFOA releases that pose unacceptable risk, including migration off-base, in accordance with CERCLA;
- Develop drinking water sampling guidance for PFOS/PFOA - where drinking water samples indicate unacceptable risk, as defined by exceeding US EPA's lifetime drinking water Health Advisory (HA) for PFOS and PFOA, take appropriate mitigation action for all sources on current and former ANG installations, as well as public and private water sources reasonably believed to be contaminated by ANG actions.

Six PFCs are also included on US EPA's Unregulated Contaminant Monitoring Rule-3 (UCMR) list of contaminants evaluated in large drinking water systems. Samples will be used to assess drinking water systems and evaluate occurrence frequency/concentration. The six constituents that will be sampled during PFC investigations per USAF guidance are as follows:

- PFOS;
- PFOA;
- perfluorononanoic acid (PFNA);
- perfluorohexane sulfonic acid (PFHxS);
- perfluoroheptanoic acid (PFHpA); and,
- perfluorobutanesulfonic acid (PFBS).

## 1.2 Work Plan Organization

This SI Work Plan is organized into the following seven sections:

Section 1 provides an introduction to the project including the scope and objectives.

Section 2 provides site background information including the site history and previous investigations.

Section 3 provides a description of Tucson ANGB including topography, drainage, geology, hydrology, critical habitat and threatened and endangered species.

Section 4 describes the preliminary exposure pathways at the installation specific to the fourteen PRLs.

Section 5 summarizes the general approach to the SI.

Section 6 details the planned SI field operations that will be conducted to meet the objectives of the SI, including the latest industry best management practices to ensure defensible data quality.

Section 7 provides a list of references used in this Work Plan.

The following appendices are included in this Work Plan:

**Appendix A** - Figures referred to in the Work Plan.

**Appendix B** – Preliminary Assessment

**Appendix C** - Laboratory Quality Assurance Project Plan (QAPP) including key worksheets from the Uniform Federal Project QAPP guidelines. This QAPP consists of the detailed procedures/methods for contaminant sampling and analysis, and addresses quality assurance (QA) and quality control (QC) methods used to control sampling activities on the project.

**Appendix D** - Field-related Standard Operating Procedures (SOPs) including a SOP specially developed for sampling/analysis of PFCs.

**Appendix E** - Accident Prevention Plan (APP). A site-specific Health and Safety Plan detailing the field hazards and methodologies to mitigate these hazards to ensure safe working conditions are established for site workers is included as part of the APP.

### 1.3 Project Organization and Responsibilities

The project organization is provided below. For this SI, Mark MacEwan is the AECOM Program Manager, Mike Myers is the AECOM Project Manager, Gregory Wills is the ANG Program Manager, Todd Church is the Regional Task Manager, and Mr. Eder Delgadillo is the Tucson ANGB Environmental Manager.

The following additional AECOM personnel will provide programmatic support on this project:

- Michael Aucoin – Chemist, National PFC Program
- Dorin Bogdan – Regulatory Specialist, National PFC Program
- Dora Chiang – Technical Director, National PFC and Other Emerging Contaminants Program

For the SI field operations, Bradley Marschke is the AECOM Field Manager. He will supervise and coordinate field activities and will act as the liaison between site personnel and field subcontractors, mainly the driller (Cascade).

Additional office-based personnel will support the project including the project chemist (Mr. Naoum Tavantzis), geographic information system (GIS) data manager (Ms. Allison Carr), and health & safety manager (Mr. Alberto Munuera). Project stakeholders include Mr. William Ellet from the Arizona Department of Environmental Quality (ADEQ) and Ms. Mary Aycock and Dr. Gerald Hiatt from the US EPA.

**Table 1** presents a list of the key personnel involved with the execution of the SI.

**Table 1. Points of Contact**

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## 2. Background Information

### 2.1 Site History

Tucson Air National Guard (ANG) Base is located in Tucson, Arizona. The ANGB is located on 94 acres on the northwestern portion of the Tucson International Airport. The 162<sup>nd</sup> Wing, located at Tucson ANGB, is home to a squadron of F-16 Fighting Falcon aircraft. The mission of the 162<sup>nd</sup> Wing is to provide education and training for F-16 aircrews, in addition to providing air defense and homeland security.

Aircraft support operations at Tucson ANGB include aircraft fueling and maintenance, aircraft deicing, fire protection and support, ground vehicle fueling and maintenance, equipment and facilities maintenance. Fire training activities were only conducted on-site prior to the start of the USAF and the ANG using AFFF in approximately 1970, therefore it is not expected that AFFF was used on-Base. Operations related to the use and/or storage of aqueous film forming foam (AFFF) have historically occurred at various locations at Tucson ANGB to provide support to the overall 162<sup>nd</sup> Wing missions. AFFF is used for fighting Class B Liquid Hydrocarbon fires, which the ANG has historically used for various mission support activities, including for suppressing aircraft/vehicle fires and in aircraft hangar fire suppression systems.

### 2.2 Previous PFC Related Investigations

No previous PFC sampling has been conducted at Tucson ANGB. A basewide PA was conducted at Tucson ANGB in 2016 to assess known and potential releases of PFCs from AFFF at Fire Training Areas (FTAs) and Non-Fire Training Areas (NFTAs) (BB&E, 2016). The PA included assessments of sites to determine if there was sufficient information that would indicate that a release of PFCs at PRLs that could impact human health and the environment. The PA included the following tasks:

- Review of information and reports in the available Administrative Record;
- Review of documents related to the ANG's use of AFFF;
- Site visit to Tucson ANGB;
- Interviews with base Environmental Manager (EM) and the Base Fire Chief;
- Photography of locations where AFFF has been used or may have been used; and
- Environmental data records searches to document nearby populations, water supply well information, and wetlands.

A total of sixteen locations were reviewed and closeout was recommended at one of the locations and another location is located off-base. The ANG determined that investigation would be conducted at fourteen PRLs to provide consistency within the ANG program in evaluating potential PFC releases on Base. The recommendations from the PA report are provided in **Table 2** below and the PRLs are shown on **Figure 2-1**. A copy of the PA is included in **Appendix B** for reference.

**Table 2. PRLs Included in the Tucson ANGB SI**

Site Description	Recommendation	Rationale
Building 50 –Fire Station	Site Investigation	Unused AFFF stored at this location, as well as AFFF in fire trucks. AFFF is filled from containers into fire trucks at this building.
Building 35 – Fuel Cell Maintenance and Corrosion Control	Site Investigation	Previously contained an AFFF FSS.
IRP Site 5 - Old Washrack Area	Site Investigation	Former washrack for Base vehicles including fire trucks until 1985.
Building 12 – Maintenance Hangar	Site Investigation	Only hangar on Base with active AFFF FSS. One known release of AFFF.

Building 10 – Maintenance Hangar	Site Investigation	Hangar with former AFFF FSS until 2004/2005.
Former Concrete Ramp	Site Investigation	Base personnel recall portions of the ramp being “foamed” with AFFF during fuel spills and one airplane crash circa 1997.
Current Concrete Ramp	Site Investigation	Adjacent to Buildings 10 and 12 which had/have AFFF FSS. Any discharges from these buildings would have entered the ramp and flowed into storm drains.
Former Nozzle Testing Area	Site Investigation	Nozzle testing on a dirt area with AFFF.
Unlined Drainage Ditch	Site Investigation	Receives and conveys stormwater from the western portion of the Base, including the Current Concrete Ramp, the Former Nozzle Testing Area, and Building 35 – Fuel Cell Maintenance and Corrosion Control.
Outfall W01	Site Investigation	Receives drainage from the Current Concrete Ramp and the Current Nozzle Testing Area where there has been known AFFF use.
Outfall W06	Site Investigation	Receives drainage from Building 50 – Fire Station where AFFF is stored.
Outfall W10	Site Investigation	Receives drainage from Buildings 10 and 12 (known AFFF use and release), as well as potential releases from Building 9.
Outfall W13	Site Investigation	Received drainage from Former Concrete Ramp where there was known AFFF use.
Outfall W14	Site Investigation	Received drainage from Former Concrete Ramp where there was known AFFF use.
<div style="display: flex; justify-content: space-between;"> <div> AFFF – Aqueous Film Forming Foam  FSS – Fire Suppression System  IRP – Installation Restoration Program </div> <div> PFC – Perfluorinated Compound  PRL – Potential Release Location  SI – Site Investigation </div> </div>		

## 2.2.1 Background Information on PRLs Recommended for SI Activities

The following descriptions are based on the 2016 PA.

### 2.2.1.1 Building 50 – Fire Station

Building 50, the current Fire Station, was built in 1993 where fire rescue vehicles, equipped with AFFF are stored. The current storage capacity of the vehicles stored within the building is approximately 1,500 gallons, but historically has been as much as 2,100 gallons. Filling of vehicles has occurred both manually via 5-gallon pails and via gravity from the foam trailer within the Fire Station. The floor drains within Building 50 are connected to an oil/water separator (OWS), which discharges to the sanitary sewer system. There were no known releases of AFFF within Building 50 or inadvertent discharges outside the current Fire House.

### 2.2.1.2 Building 35 – Fuel Cell Maintenance and Corrosion Control Hangar

Building 35 was built in 1989 and was previously equipped with an AFFF fire suppression system (FSS), which has since been converted to a high expansion foam (HEF) FSS. The floor drains within Building 35 are connected to an OWS, which discharges to the sanitary sewer system. There were no known releases of AFFF within Building 35 or inadvertent discharges outside the Fuel Cell Maintenance and Corrosion Control Hangar, but if there had been, it could potentially have drained to the Unlined Drainage Ditch to Outfall W01 (see Sections 2.2.1.9 and 2.2.1.10).

#### 2.2.1.3 IRP Site 5 – Old Washrack Area

Located on the eastern corner of Building 33, which is now the Weapons and Release Systems Shop, the old washrack area was used from 1959 until 1985 and served vehicles from the engine shop, other aircraft maintenance shops and the Fire Station. Prior to 1980, the old washrack area discharged into the Airport Wash, a tributary of the Santa Cruz River, at the Base gatehouse. From 1980 until 1985, the area was connected to an OWS, which discharged to the sanitary sewer system. The old washrack area was investigated as an Installation Restoration Program (IRP) site, which included a PA, RI and Focused Feasibility Study. Through the IRP process, volatile organic compounds (VOC) were identified in the soil and 64 pounds of VOCs were removed by soil vapor removal. PFCs were not a part of this investigation process.

#### 2.2.1.4 Building 12 – Maintenance Hangar

Building 12 was built in 1991 and is the only building on base that currently has an active AFFF FSS. This maintenance hangar houses a 1,200-gallon AFFF storage tank. The floor drains within Building 12 are connected to an OWS, which discharges to the sanitary sewer system. An accidental release of AFFF occurred at this building; draining to the stormwater drains outside of the building, and discharging through Outfall W10 (see Section 2.2.1.12) into Airport Wash. Additionally, upon installation of the FSS, the system was tested. No further information was available for the accidental discharge or the testing release.

#### 2.2.1.5 Building 10 – Maintenance Hangar

Building 10 was built in 1994 and was previously equipped with an AFFF FSS, which has since been converted to an HEF FSS. The floor drains within Building 10 are connected to an OWS, which discharges to the sanitary sewer system. Upon initial installation of the former AFFF FSS, the system was tested. No further information was available for the testing release, but had any AFFF left the building, it would have drained to the stormwater drains outside of the building, and discharged through Outfall W10 (see Section 2.2.1.12) into Airport Wash.

#### 2.2.1.6 Former Concrete Ramp

Located near Buildings 10 and 12, typical operations at the Former Concrete Ramp, such as parking, fueling or minor maintenance of aircraft, may have resulted in the periodic release of AFFF to the concrete, which would runoff to the grassy areas near the ramp, and then on to Outfalls W10, W13 and W14 into Airport Wash. In addition, Base personnel specifically recall AFFF foam application for fuel spills and also during a civilian aircraft crash in the southeast portion of the ramp.

#### 2.2.1.7 Current Concrete Ramp

Similar to the Former Concrete Ramp, located near Buildings 10 and 12, typical operations within the Current Concrete Ramp, such as parking, fueling or minor maintenance of aircraft, may have resulted in the periodic release of AFFF to the concrete. The runoff from this area would flow to the grassy areas near the ramp, and then on to Outfall W14 into Airport Wash (see Section 2.2.1.14).

#### 2.2.1.8 Former Nozzle Testing Area

This former nozzle testing area (NTA), currently a paved parking lot, was historically used for testing fire equipment containing AFFF. The dates of the tests and the quantities released are unknown. After testing

activities, the AFFF would be sprayed down with water to wash out into the storm drains. The runoff from this area would flow to Outfall W01 into Airport Wash (see Section 2.2.1.10).

#### 2.2.1.9 Unlined Drainage Ditch

Stormwater runoff from the southern portion of the Current Concrete Ramp, the Former Nozzle Testing Area and Building 35 all flows through this ditch, which is typically dry.

#### 2.2.1.10 Outfall W01

Located in the northwestern portion of the Base, Outfall W01 serves as the primary stormwater outfall for the drainage area where the following above-described PRLs are located: southern portion of Former Nozzle Testing Area and Building 35. This outfall discharges into Airport Wash, and westward on into Santa Cruz River.

#### 2.2.1.11 Outfall W06

Located in the north-central portion of the Base, Outfall W06 serves as the primary stormwater outfall for the drainage area where the following above-described PRLs are located: western portions of the base including Building 50 – Fire Station. This outfall discharges into Airport Wash, and westward on into Santa Cruz River.

#### 2.2.1.12 Outfall W10

Located in the north-central portion of the Base, Outfall W10 serves as the primary stormwater outfall for the drainage area where the following above-described PRLs are located: central portions of the base including the Buildings 10 and 12 – Maintenance Hangars and the Former Concrete Ramp. This outfall discharges into Airport Wash, and westward on into Santa Cruz River.

#### 2.2.1.13 Outfall W13

Located in the north-central portion of the Base, Outfall W13 serves as the primary stormwater outfall for the drainage area where the following above-described PRLs are located: Former Concrete Ramp. This outfall consists of a metal grate with a concrete headwall and discharges into Airport Wash, and westward on into Santa Cruz River.

#### 2.2.1.14 Outfall W14

Located in the eastern portion of the Base, Outfall W14 serves as the primary stormwater outfall for the drainage area where the following above-described PRLs are located: Former and Current Concrete Ramps. This outfall discharges into Airport Wash, and westward on into Santa Cruz River.

## 2.3 Regulatory Framework

PFCs are not currently regulated at the federal level, but the US EPA has defined health advisories for PFOS and PFOA, where a sampling exceedance of the HA indicates an unacceptable risk. For the purposes of the SI Report, soil, sediment, surface water and groundwater analytical testing results will be screened against Applicable or Relevant and Appropriate Requirements and other regulatory criteria including:

- US EPA Drinking Water Health Advisory for PFOS;
- US EPA Drinking Water Health Advisory for PFOA.
- US EPA's Residential – Direct Contact Soil Regional Screening Levels (RSLs).

Where multiple criteria exist, the more conservative screening value will be used. The project action levels for each Contaminant of Potential Concern (COPC) and analytical method are presented in **Appendix C**.

### 3. Site Description

This section describes the topography and site conditions for Tucson ANGB.

#### 3.1 Site Topography and Drainage

Tucson ANGB is located on the northwestern side of the Tucson International Airport in Pima County, Tucson, Arizona at 1500 East Valencia Road. The airport is located east of Interstate-19 and southwest of Interstate-10, just south of the southwestern part of the City of Tucson. The Tucson ANGB resides on 94 acres of Tucson International Airport property.

Tucson ANGB is at a surface elevation of approximately 2,560 feet (ft) above mean sea level (msl). The property features gently rolling topography, but is relatively flat, with a relief of less than 20 feet within the installation boundaries. Based on aerial imagery analysis, there are no standing water bodies on the Tucson ANGB property, but Airport Wash is an ephemeral stream, which flows as result of precipitation. Airport Wash runs along the northern and eastern boundary of Tucson ANGB and is a tributary to the Santa Cruz River. The Santa Cruz River is located approximately 2.5 miles west of the Base and flows in a northward direction, although is dry much of the year.

The majority of surface water runoff from Tucson ANGB discharges to the facility-wide stormwater drainage system, which is comprised of manmade drainage ditches and storm drainage culverts, and ultimately discharges to Airport Wash. Some storm runoff flows into a grate inlet at the wash rack; this runoff is discharged to an OWS and then to the sanitary sewer. Approximately 75 percent of the storm runoff which reaches Airport Wash infiltrates into the soil and recharges groundwater supplies (HMTC, 1987).

#### 3.2 Site Geology/Hydrogeology

The City of Tucson depends on groundwater for its municipal water, as does the Base. Basin fill sediments are found in the aquifer system in Pima County, which is known as a regional divided aquifer. The Tucson area aquifer is comprised of an upper aquifer zone, a lower aquifer zone, and an aquitard that divides the zones. Recent sands, sandy clays, and clayey sands make up the upper aquifer zone and extends to a depth of 140 ft below ground surface (bgs), with groundwater in this zone generally existing under unconfined conditions at about 80 ft bgs. Clayey sand with lenses of gravelly sand and sandy clay ranges from 370 ft bgs to an unknown depth make up the lower aquifer zone. Local historical groundwater flow at the Base is predominantly to the north-northwest towards the Santa Cruz River with a hydraulic gradient of 22 feet per mile (HMTC, 1987). During the 2013 groundwater monitoring program under the Environmental Restoration Program, the groundwater flow direction was confirmed to be consistent with the historical flow direction (TetraTech, 2015).

The soil types at Tucson ANGB have been mapped by the US Department of Agriculture, Natural Resources Conservation Service (USDA NRCS, 2017) and include the following soil map units:

Cave soils and urban land –well drained mixed alluvium material, with a gravelly fine sandy loam to cemented material to gravelly loamy sand typical profile. Capacity of the most limiting layer to transmit water is very low.

Sahuarita soils, mohave soils and urban land – well drained mixed alluvium material, with a very gravelly fine sandy loam to fine sandy loam, to sandy clay loam, to very gravelly sandy clay loam typical profile. Capacity of the most limiting layer to transmit water is moderately high.

Yaqui fine sandy loam – well drained mixed alluvium material, with a fine sandy loam, to sandy clay loam, to clay loam to gravelly loam typical profile. Capacity of the most limiting layer to transmit water is moderately high.

The capacity of the most limiting soil layer occurring at Tucson ANGB to transmit water is very low.



The hydrogeology at each PRL is a function of many factors including the underlying soils, the precipitation available for aquifer recharge, vegetative cover, slope of the ground surface, the presence or absence of unconsolidated alluvial material, the permeability of the alluvial material, if present, the permeability of the bedrock, and stresses placed upon the groundwater systems from the groundwater withdrawals.

### 3.3 Critical Habitat and Threatened/Endangered Species

The following mammals and birds are federally endangered, threatened, proposed, and/or are listed as candidate species in the vicinity of Tucson ANGB, Pima County, Arizona (United States Fish and Wildlife Service, 2017):

- California Least Tern (endangered)
- Yellow-billed Cuckoo (threatened)
- Pima Pineapple Cactus (endangered)
- Jaguar (endangered)
- Lesser Long-nosed Bat (endangered)
- Northern Mexican Gartersnake (threatened)
- Sonoyta Mud Turtle (proposed endangered)

These species are not known to have critical habitat identified on the Base.

## 4. Fate and Transport and Preliminary Pathway Evaluation

The fate and transport for PFCs is highly dependent upon surface water and groundwater flow direction since PFCs are highly soluble in water. The purpose of the preliminary pathway evaluation is to identify the migration pathways and evaluate available data, including potential contamination sources, potential hazardous waste quantity, contamination concentrations, and potential targets. Targets include both human and ecological receptors that may be exposed to any potential releases from the PRLs. Migration and exposure pathways that are considered complete may be recommended for further evaluation after completion of the SI. The proposed scope of work (see Section 5) has been developed to address data gaps identified in the preliminary pathway evaluation. A Conceptual AFFF Site Model is depicted in **Figure 4-1 (Appendix A)** showing the potential pathways. The subsections below describe the general fate and transport mechanisms for PFCs and pathway evaluation further.

### 4.1 Fate and Transport

There are many different factors that can influence this fate and transport resulting in a complex Conceptual Site Model (CSM). This is especially true when PFCs are co-mingled with hydrocarbon fuels as is often the case at FTAs, spill sites, or crash sites. When hydrocarbon fuels are released, indigenous microorganisms rapidly biodegrade/oxidize the fuels resulting in anaerobic conditions (i.e. negative redox) at the source area.

Department of Defense (DoD) used seven different manufactures that produced AFFFs meeting the Military Specification (Mil-Spec) MIL-F-24385. The civilian airports also used Mil-Spec AFFFs due to their superior performance. The U.S. Navy Research Laboratory in collaboration with 3M first developed AFFF in the late 1960's (Anderson, 2016). The company 3M manufactured AFFF using the electrochemical fluorination (ECF) process. Six additional manufacturers (Ansul, National Foam, Angus, Chemguard, Buckeye, and Fire Service Plus) later produced AFFF meeting the Mil-Spec using telomerization process. The composition of these AFFFs changed over time and many times without changing the product name. The AFFFs are mixtures of many PFCs with some of them known as precursors. The precursors could go through abiotic and biotic transformation resulting in the production of dead end compounds, such as PFOS and PFOA under aerobic conditions. The resulting PFCs forming from transformation of precursors are stable and do not degrade. Some of the precursors from AFFFs are cationic and zwitterionic, which have a stronger sorption to soils compared to other anionic PFCs such as PFOS and PFOA (Backe et al., 2013). The precursors will most likely not transform close to source zones where fuels are also present and will migrate downgradient until the fuels attenuate. Once the PFC plume reaches an area where aerobic conditions exist, the precursors will start the process of transformation and result in increasing concentrations of Perfluoroalkyl Acids (PFAAs) including PFOS and PFOA (Harding-Marjanovic, 2017; Weber, 2017). In the case of any PFC detections, the available information on AFFFs will be used in the CSM in order to understand the environmental fate and potential sources of PFCs.

### 4.2 Preliminary Pathway Evaluation

#### 4.2.1 Groundwater

Potential human exposure pathways related to groundwater are the use of any drinking water wells and irrigation wells for public or private water supply or irrigation purposes or potential impacts to source aquifers. Groundwater use will be described in the SI Report. Any available information on background water quality for groundwater will also be considered. As of 1989, there are longer drinking water supply wells at or near the Base. The use of these wells was discontinued when trichloroethene (TCE) contamination was discovered (ANG, 2006), associated with the Tucson International Airport Area Superfund Site. Before the discovery of the TCE contamination, wells near the Base supplied approximately 47,000 people. The Base is provided water via the municipal water distribution system operated by the Tucson Water Company. All of the City of Tucson's potable water comes from aquifers of the Tucson Basin, therefore the basin's groundwater system is designated a Sole Source Aquifer under the federal Safe Drinking Water Act.

#### 4.2.2 Surface Water and Sediment Pathway

Potential human exposures from surface water include use of surface water for drinking water, recreation and fisheries. Potential ecological receptors and exposures include sensitive environments and protected species that may be associated with the surface water. Surface water in the area, including any sensitive environments or protected species in the area will be included in the SI Report.

The majority of surface water runoff from Tucson ANGB discharges to the facility-wide stormwater drainage system, which is comprised of manmade drainage ditches and storm drainage culverts, and ultimately discharges to Airport Wash. Some storm runoff flows into a grate inlet at the wash rack; this runoff is discharged to OWS and then to the sanitary sewer. Approximately 75 percent of the storm runoff that reaches Airport Wash infiltrates into the soil and recharges groundwater supplies.

The surface water from the site is not a primary source of drinking water, so there is currently not an exposure pathway.

#### 4.3 Soil Exposure and Air Migration Pathways

Humans may be exposed to surface and sub-surface soils during routine activities or during construction and excavation activities. Ecological receptors may also be exposed to soils if sufficient habitat is present to support or attract terrestrial flora and fauna including burrowing animals. Both current and future conditions will be considered.

Zoning and land use for both current and potential future conditions will be evaluated. The potential for any sensitive human uses such as hospitals, schools, day care centers, playgrounds, as well as residential and military housing use will be identified and described in the SI Report. Information on size of human communities (e.g., census or population and workforce data) will be included, if available. If habitat exists, a short description of habitat and ecological community and results of records search for sensitive terrestrial environments and protected species will be included in the SI Report.

Tucson ANGB has mixed use and the surrounding area includes zoning for industrial, residential, office, and commercial. Tucson ANGB includes paved and landscaped areas and as such, there are limited pathways to soil and air migration from disturbed soils under normal operating conditions. However, during excavation, a worker could be exposed to soil and dust from soil.

## 5. SI Approach

This section describes the SI field activities proposed for the PRLs at Tucson ANGB. The objectives for the SI are to determine presence or absence of PFCs in soil or surface water or sediment (if present) at each PRL and in groundwater downgradient of PRLs, and assess if PFC constituents from the base are migrating off site.

A number of standardized approaches have been incorporated into the SI when considering sources, sampling strategies, and associated fate and transport (i.e., potential for off-base impact). For instance, the PRLs are categorized by release mechanism; as an example, ramps, aprons, paved FTAs, paved nozzle testing areas, and wash rack areas are all considered different kinds of PRLs, but when considering the release mechanism for each of these PRLs, they all would have involved initial releases to adjacent low-lying surface soils and in surface water runoff. Importantly, all of these types of PRLs generally involve open and accessible impervious surfaces, allowing samples to be collected immediately adjacent to or downgradient of the PRL. As such, all of these PRLs are combined in to the same “category” type.

Given this common release mechanism and accessibility, a consistent sampling strategy for these PRLs is important. In this case, the focus would be on low-lying pervious areas adjacent to paved areas, or any storm-water/surface water features in the area. Eight different potential general CSM categories have been developed based on the type of PRL/release mechanism. The classification approach used within this Work Plan reflects a project-specific, consistent approach used for the multiple ANG bases associated with this contract. The different CSM categories, potential PRL types, and general sampling approach are provided in **Table 3**. Note that not all of these CSM categories or PRL types are located at Tucson ANGB.

**Table 3. General Sampling Approach by PRL CSM Category**

CSM Category	PRL Type	General Sampling Approach	PRL Type Influence on CSM and Other General Comments
1	Current Buildings including Hangars with AFFF Fire Suppression Systems and Fire Stations	3 soil borings and 1 downgradient well per PRL except for large PRLs such as aprons and sludge drying beds where due to their large size, up to 6 soil borings and 3 downgradient wells are proposed.	<ul style="list-style-type: none"> <li>Near surface soil samples important because release would have been to the surface</li> <li>Groundwater impacts more likely as a result of surface water runoff</li> </ul>
2	Former Building Footprints including Hangars and Fire Stations		<ul style="list-style-type: none"> <li>Near surface soil samples important because release would have been to the surface</li> <li>Groundwater impacts more likely as a result of surface water runoff</li> </ul>
3	Open Impervious Surfaces – including Ramps, Aprons, Paved Fire Training Areas, and Paved Nozzle Testing Areas		<ul style="list-style-type: none"> <li>Near surface soil samples important because release would have been to the surface</li> <li>Groundwater impacts more likely as a result of surface water runoff</li> </ul>
4	Open Pervious Surfaces - including Grassy Fire Training Areas, Grassy Nozzle Testing Areas, Dry Detention Basins, and Dry Storm-water Drainage Basins		<ul style="list-style-type: none"> <li>Near surface soil samples important because release would have been to the surface</li> <li>Groundwater impacts more likely as a result of surface water runoff</li> </ul>
5	Drainage Ditches	3 surface water and sediment locations along the length of the unlined drainage ditch and at its	<ul style="list-style-type: none"> <li>Near surface soil samples important because release would have been to the surface</li> </ul>

CSM Category	PRL Type	General Sampling Approach	PRL Type Influence on CSM and Other General Comments
		outfall	<ul style="list-style-type: none"> <li>Groundwater impacts may be in areas other than downgradient groundwater</li> </ul>
6	Storm-water Outfalls	1 surface water/sediment sample at the outfall itself	<ul style="list-style-type: none"> <li>Near surface soil samples important because release would have been to the surface</li> <li>Groundwater impacts may be in areas other than downgradient groundwater.</li> </ul>
7	Former Septic System	3 soil boring/wells in association with former or abandoned-in-place structures identified	<ul style="list-style-type: none"> <li>Near surface soil samples not needed because source is subsurface</li> <li>Groundwater impacts more likely as a result of subsurface leakage</li> </ul>
OBM	Off-Base Migration	A minimum of one well will be monitored at the base boundary to evaluate off-base migration.	<ul style="list-style-type: none"> <li>Total number of wells are dependent upon the number and aerial extent of PRLs as well as the groundwater flow direction (i.e. is there more than one direction of groundwater flow).</li> </ul>

The “PRL Type” categories that exist at Tucson ANGB are Categories 1, 3, 5, 6, and OBM. These CSM categories/release mechanisms have been used to determine where and how the samples should be located/collected (e.g. a surface soil sample provides limited value when the release was from a subsurface storm-water sewer). This sampling approach also ensures consistent and accurate development of an initial CSM for each PRL because data are collected at the most critical locations. This initial CSM would then inform and guide proposed sampling for the RI, if warranted.

The sampling approach at Tucson ANGB includes the following:

- **Soils** - Two soil samples will be collected at each boring location, one from the surface (0-1 feet bgs) and one subsurface soil sample from the 4-5 foot bgs interval or at the elevation equivalent to the bottom elevation of a relevant appurtenance (such as an underground storm water pipe or oil water separator) not to exceed 10 feet bgs. Borings will be located in the most likely impacted area that is not paved. At the request of the ANG, borings will generally not be placed in concrete/paved areas unless the concrete/paved area is compromised (i.e. cracked) due to wear or age. Therefore, borings will be placed in the unpaved areas that collect the most volume of surface water sheet-flow from the paved areas. In some but not all PRLs, a boring used for collection of soil samples will be converted into a permanent monitoring well. Otherwise, a separate boring location will be used to advance the completion of the permanent monitoring well without soil sampling other than typical field screening using a photoionization device (PID).
- **Groundwater Monitoring Wells** – Existing monitoring wells will be used where possible. Review of the construction materials will be conducted to ensure that they are PFC-free. Unless specifically stated, all monitoring wells installed as part of this SI will be permanent. Installation of permanent monitoring wells provides the ANG with the opportunity to resample the well as part of the RI phase, if applicable.
- **Sediment and Surface Water** - For drainage ditches, three or more (depending upon the length of the ditch) co-located sediment and surface water samples will be collected spaced apart at locations biased towards areas most likely to be impacted from PFC containing runoff, such as discharges to the ditch from other drainage areas. At least one sediment/surface water collection point will be placed in the most downstream location prior to exiting the installation. Similarly, one sediment and surface water sample will be collected from each outfall PRL.

## 5.1 PRL Specific Approaches

The general approach outlined above has been used to develop the specific approach for each PRL included in this SI. **Table 4** provides a summary of the sampling approach with specific information for each PRL provided in the subsections below.

**Table 4. SI Sampling Program**

Location	PRL Type #	Site ID Codes	Estimated Number of Borings and Monitoring Wells to be Installed	Estimated Depth of New Borings (ft bgs)	Number of Samples	Figure Showing Sampling Locations
Building 50 –Fire Station	1	50	3 SB 1 MW <sup>1</sup>	<b>Soil:</b> 10 <b>MW:</b> 100	<b>Soil:</b> 6 Samples <b>Groundwater:</b> 1 Sample	Figure 5-1
Building 35 – Fuel Cell Maintenance and Corrosion Control	1	35	3 SB 1 MW <sup>2</sup>	<b>Soil:</b> 10 <b>MW:</b> 100	<b>Soil:</b> 6 Samples <b>Groundwater:</b> 1 Sample	Figure 5-2
IRP Site 5 - Old Washrack Area	3	IRP	3 SB 1 MW <sup>3</sup>	<b>Soil:</b> 10 <b>MW:</b> 100	<b>Soil:</b> 6 Samples <b>Groundwater:</b> 1 Sample	Figure 5-3
Building 12 – Maintenance Hangar	1	12	3 SB 1 MW <sup>4</sup>	<b>Soil:</b> 10 <b>MW:</b> 100	<b>Soil:</b> 6 Samples <b>Groundwater:</b> 1 Sample	Figure 5-4
Building 10 – Maintenance Hangar	1	10	3 SB 1 MW	<b>Soil:</b> 10 <b>MW:</b> 100	<b>Soil:</b> 6 Samples <b>Groundwater:</b> 1 Sample	Figure 5-5
Former Concrete Ramp	3	FCR	6 SB 4 MW <sup>5</sup>	<b>Soil:</b> 10 <b>MW:</b> 100	<b>Soil:</b> 12 Samples <b>Groundwater:</b> 4 Samples	Figure 5-6
Current Concrete Ramp	3	CCR	6 SB 5 MW <sup>6</sup>	<b>Soil:</b> 10 <b>MW:</b> 100	<b>Soil:</b> 12 Samples <b>Groundwater:</b> 5 Samples	Figure 5-7
Former Nozzle Testing Area	3	FNTA	3 SB 1 MW <sup>7</sup>	<b>Soil:</b> 10 <b>MW:</b> 100	<b>Soil:</b> 6 Samples <b>Groundwater:</b> 1 Sample	Figure 5-8
Unlined Drainage Ditch	5	UDD	3 SW 3 SD 1 MW <sup>8</sup>	<b>Soil:</b> 10 <b>MW:</b> 100	<b>Surface Water:</b> 3 Samples <b>Sediment:</b> 3 Samples <b>Groundwater:</b> 1 Sample	Figure 5-9
Outfall W01	6	W01	1 SW 1 SD	NA	<b>Surface Water:</b> 1 Sample <b>Sediment:</b> 1 Sample	Figure 5-10
Outfall W06	6	W06	1 SW 1 SD	NA	<b>Surface Water:</b> 1 Sample <b>Sediment:</b> 1 Sample	Figure 5-11
Outfall W10	6	W10	1 SW 1 SD	NA	<b>Surface Water:</b> 1 Sample <b>Sediment:</b> 1 Sample	Figure 5-12
Outfall W13	6	W13	1 SW 1 SD	NA	<b>Surface Water:</b> 1 Sample <b>Sediment:</b> 1 Sample	Figure 5-13
Outfall W14	6	W14	1 SW 1 SD	NA	<b>Surface Water:</b> 1 Sample <b>Sediment:</b> 1 Sample	Figure 5-14
Base Boundary Wells	OBM	BBW	3 MW <sup>9</sup>	<b>MW:</b> 100	<b>Groundwater:</b> 3 Samples	Figure 5-15

SB = Soil Borings

MW = Permanent Monitoring Wells

SW = Surface Water

SD = Sediment

<sup>1</sup> Includes existing monitoring well MW73-U to evaluate potential groundwater impacts from Building 50.

<sup>2</sup> Includes existing monitoring well PT-1 to evaluate potential groundwater impacts from Building 35.

<sup>3</sup> Includes existing monitoring well MW05-U to evaluate potential groundwater impacts from IRP Site 5. <sup>4</sup> Includes

existing monitoring well MW74-U to evaluate potential groundwater impacts from Building 12.

<sup>5</sup> Includes existing monitoring well MW72-U and 10-MW01 to evaluate potential groundwater impacts from Former Concrete Ramp.

<sup>6</sup> Includes existing monitoring wells MW74-U, MW92-U, MW93-U, MW96-U, and MW97-U to evaluate potential groundwater impacts from Current Concrete Ramp.

<sup>7</sup> Includes existing monitoring well PT-5 to evaluate potential groundwater impacts from Former Nozzle Testing Area.

<sup>8</sup> Includes existing monitoring well UEW-11 to evaluate potential groundwater impacts from Unlined Drainage Ditch and Outfall W01.

<sup>9</sup> Includes existing monitoring well UEW-11, MW100-U, and MW03-U to evaluate potential groundwater impacts at the Base Boundary.

### 5.1.1 Building 50 – Fire Station

Based on discussions with Tucson ANGB personnel during a site visit on 18 January 2017 to kick-off the SI project, AFFF was stored and filled into fire trucks at this building. There were no reported AFFF releases within this building. Based on the historical use of AFFF within this building and the storage of Fire Department (FD) vehicles in this building, one soil boring will be located just southeast of Building 50 and two soil borings will be located to the northwest of Building 50. One existing groundwater monitoring well (MW73-U), is located in the immediate downgradient direction of groundwater flow from Building 50 (to the northwest) and will be sampled to evaluate potential groundwater impacts. The locations of the proposed soil borings and existing monitoring well are provided on **Figure 5-1**.

### 5.1.2 Building 35 –Fuel Cell Maintenance and Corrosion Control

AFFF was previously used in Building 35's FSS. There were no reported AFFF releases within this building. If any AFFF releases had occurred within the Former Fuel Cell Maintenance and Corrosion Control building, the AFFF would likely have discharged to the floor drains within the building, through the OWS and on to the sanitary sewer system. One soil boring will be located just south of Building 35, one soil boring will be located just northeast of Building 35, and one soil boring will be located just northwest of Building 35. One existing groundwater monitoring well (PT-1), is located in the immediate downgradient direction of groundwater flow from Building 35 (to the northwest) and will be sampled to evaluate potential groundwater impacts. The locations of the proposed soil borings and existing monitoring well are provided on **Figure 5-2**.

### 5.1.3 IRP Site 5 – Old Washrack Area

There are no known historical releases of AFFF in or around the Old Washrack Area, which prior to 1980, discharged to Airport Wash and post-1980 discharged to an OWS and on to the sanitary sewer system. Based on the historical use of AFFF within this area, one soil boring will be located just southeast of IRP Site 5 and two soil borings will be located to the northwest of IRP Site 5. One existing groundwater monitoring well (MW05-U), is located in the immediate downgradient direction of groundwater flow from IRP Site 5 and will be sampled to evaluate potential groundwater impacts. The locations of the proposed soil borings and existing monitoring well are provided on **Figure 5-3**.

### 5.1.4 Building 12 – Maintenance Hangar

AFFF is still currently used in Building 12's FSS. Based on this, along with the historical accidental release of AFFF within this building, one soil boring is located to the southwest of the PRL and two of the soil borings are to the northwest. One existing groundwater monitoring well (MW74-U), is located in the immediate downgradient direction of groundwater flow from Building 12 and will be sampled to evaluate potential groundwater impacts. The locations of the proposed soil borings and existing monitoring well are provided on **Figure 5-4**. A new groundwater monitoring well (12-MW01) will be installed at the same location as one of the downgradient soil borings, as illustrated in **Figure 5-4**.

### 5.1.5 Building 10 – Maintenance Hangar

There have not been any documented or historical knowledge of releases of AFFF in Building 10. Based on the historical use of AFFF within this building's FSS, one soil boring will be located just southeast of Building 10 and two soil borings will be located to the northwest of Building 10. One of those soil borings will be converted into a new groundwater monitoring well (10-MW01), which will be installed in a location that is in the immediate downgradient direction of groundwater flow from Building 10 (to the northwest). The locations of the proposed soil borings and monitoring well are provided on **Figure 5-5**.

### 5.1.6 Former Concrete Ramp

Based upon typical operations related to potential releases of AFFF on the Former Concrete Ramp, along with foam application for fuel spills and the 1997 airplane crash, soil borings are located around the Former Concrete Ramp, with the assumption that runoff from any potential release would have flowed to one of these areas (see **Figure 5-6**). A total of six soil borings are located in all directions, but with a majority focused in the downgradient direction of likely surface water flow (to the northwest). Due to the large size of the aircraft apron, two of the borings will be converted into new monitoring wells (FCR-MW01 and FCR-MW02). These new monitoring wells, along with one existing groundwater monitoring well (MW72-U) will be located to the northwest of the apron, in the immediate downgradient direction of groundwater flow at this location. MW72-U and an additional monitoring well (10-MW01) associated with Building 10 will also be sampled to evaluate potential groundwater impacts at this site.

### 5.1.7 Current Concrete Ramp

Based upon typical operations related to potential releases of AFFF on the Current Concrete Ramp, soil borings are located around the Current Concrete Ramp, with the assumption that runoff from any potential release would have flowed to one of these areas (see **Figure 5-7**). A total of six soil borings are located in all directions, but with a majority focused in the downgradient direction of likely surface water flow (to the northwest). Due to the large size of the aircraft apron, five existing groundwater monitoring wells (MW75-U, MW92-U, MW93-U, MW96-U, and MW97-U) located in all directions will be sampled to evaluate potential groundwater impacts at this site.

### 5.1.8 Former Nozzle Testing Area

Based upon typical operations related to fire equipment testing with AFFF, soil borings are located within the boundary of the Former Nozzle Testing Area (see **Figure 5-8**). A total of three soil borings will be advanced, one in the upgradient area and two in the downgradient direction of groundwater flow. One existing groundwater monitoring well (PT-5), located immediately downgradient of the site will be sampled to evaluate potential groundwater impacts at the site.

### 5.1.9 Unlined Drainage Ditch

Based upon its location in the upgradient-direction of many PRLs and the surface water runoff it receives from those PRLs, three co-located sediment and surface water samples will be collected within the Unlined Drainage Ditch (see **Figure 5-9**). Additionally, one new monitoring well (UDD-MW01), will be installed downgradient of the site and will be sampled to evaluate potential groundwater impacts at the site.

### 5.1.10 Outfall W01

Outfall W01 was identified as a PRL due to the potential discharge of PFC-containing surface water from the following PRLs on Tucson ANGB: southern portion of Former Nozzle Testing Area and Building 35. One co-located sediment and surface water sample will be collected at this location. Surface water/sediment sampling locations are illustrated on **Figure 5-10**.



#### 5.1.11 Outfall W06

Outfall W06 was identified as a PRL due to the potential discharge of PFC-containing surface water from the following PRLs on Tucson ANGB: western portions of the base including Building 50 – Fire Station. One co-located sediment and surface water sample will be collected at this location. Surface water/sediment sampling locations are illustrated on **Figure 5-11**.

#### 5.1.12 Outfall W10

Outfall W10 was identified as a PRL due to the potential discharge of PFC-containing surface water from the following PRLs on Tucson ANGB: central portions of the base including the Buildings 10 and 12 – Maintenance Hangars and the Former Concrete Ramp. One co-located sediment and surface water sample will be collected at this location. Surface water/sediment sampling locations are illustrated on **Figure 5-12**.

#### 5.1.13 Outfall W13

Outfall W13 was identified as a PRL due to the potential discharge of PFC-containing surface water from the following PRLs on Tucson ANGB: Former Concrete Ramp. One co-located sediment and surface water sample will be collected at this location. Surface water/sediment sampling locations are illustrated on **Figure 5-13**.

#### 5.1.14 Outfall W14

Outfall W14 was identified as a PRL due to the potential discharge of PFC-containing surface water from the following PRLs on Tucson ANGB: Former Concrete Ramp and Current Concrete Ramp. One co-located sediment and surface water sample will be collected at this location. Surface water/sediment sampling locations are illustrated on **Figure 5-14**.

#### 5.1.15 Base Boundary Wells

Analytical data from three existing monitoring wells will be utilized to monitor if PFCs are migrating off base. The three existing monitoring wells (MW03-U, MW100-U, and UEW-11) are located along the north-northwestern-most portion of the edge of the Tucson ANGB boundary and are selected for this investigation in order to evaluate groundwater flow from all of the PRLs. The locations of the existing monitoring wells are illustrated on **Figure 5-15**.

## 6. Field Investigation Procedures

The field investigation operations consist of site preparation activities including the mobilization/demobilization of field team personnel and equipment, utility clearance, and surface/subsurface soil and groundwater sampling for PFCs using hollow-stem auger (HSA) drilling method. Details concerning sampling activities and analytical methodology including specific procedures for PFC-related investigations are presented in the SOPs (**Appendix D**). Procedures as outlined in the AECOM PFC-specific SOP, included as the first guidance document in Appendix D, take precedence over the other SOPs. Health and safety requirements for SI field activities are provided in the APP (**Appendix E**).

### 6.1 Site Preparation

No vegetation clearance is planned during field investigation activities; rather the field team will work around existing site vegetation. Traffic control measures may be required to complete investigations near some PRLs. If traffic control is deemed necessary at a PRL, it will be coordinated with Tucson ANGB operations personnel.

### 6.2 Personnel Qualifications

All personnel mobilized to the site will meet applicable Occupational Safety and Health Administration training including hazardous waste operations and emergency response (HAZWOPER) training and medical surveillance requirements as specified in the APP (**Appendix E**).

### 6.3 Permits and Notifications

Utility clearance will be conducted by Tucson ANGB with input from the AECOM field team. AECOM or its drilling subcontractor will contact "Arizona 811", the Arizona one-call utility clearance contractor. Dig information can be input into the system on-line at Arizona811.com or by calling 811. AECOM will also complete the utility clearance request (AF Form 103) and submit it to the Base Civil Engineer and/or Base Environmental Manager at least five business days before site activities begin. A site walk will be scheduled with the appropriate Tucson ANGB personnel to mark out locations of subsurface activities. All field work will be coordinated with the Base Environmental Manager and/or his/her designee.

### 6.4 Sample Collection

#### 6.4.1 Boring Installation and Soil Sampling

Soil samples will be collected via HSA (See SOP S3AM-321-PR1, **Appendix D**). Continuous soil cores will be collected to the target depth: one surface soil sample will be collected (0-1 ft depth) and one subsurface soil sample will be collected at 4 to 5 feet bgs. Boring and or sampling depth may be adjusted in the field to sample at the depth of any PRL-specific appurtenance (such as an underground storm water pipe or oil water separator) not to exceed 10 feet bgs. If refusal is encountered before the desired depth of sample location, additional attempts will be made adjacent to the original location to collect a soil sample at the desired depth. All drilling materials will be PFC-free.

Continuous soil sampling will be completed, screened using a PID per SOP 3-20 (**Appendix D**), and manually observed for evidence of impacts (i.e. staining or odors). The soil cores will be logged for lithological descriptions by a field geologist using the Unified Soil Classification System (USCS). Observations and measurements will be recorded on field forms and in a non-treated field logbook. If permitted by the Base, photographs will also be taken of the boring cores. At a minimum, depth interval, recovery thickness, PID concentrations, moisture, relative density, color (using a Munsell soil color chart), and texture (using the USCS) will be recorded. Additional observations to be recorded may include groundwater or perched water depth, organic material, or cultural debris.

Each sample will be collected into laboratory-supplied "PFC free" high density polyethylene (HDPE) jars and labelled in pencil, and submitted to the laboratory for analysis of selected parameters. The laboratory method detection limits for these analytes are presented in the QAPP (**Appendix C**). Samples will be packaged on ice and transported via overnight commercial carrier under standard chain-of-custody procedures to the laboratory (See SOP 3-03 and SOP 3-04, **Appendix D**).

Field duplicate samples will be collected at a rate of 10% and analyzed for the same parameters as the accompanying samples. Matrix spike and matrix spike duplicates will be collected at the rate of 5% and analyzed for the same parameters as the accompanying samples. Field reagent blanks will accompany each cooler containing samples for PFC analysis and will be analyzed for the project-specific list of PFCs. Due to the potential for cross-contamination, equipment blanks will be collected and analyzed. A temperature blank shall be placed in each cooler to ensure that samples are preserved between zero and four degrees Celsius during shipment.

HSA borings will be abandoned at completion of sampling activities unless they are being converted into monitoring wells. Borings in grass will be abandoned by backfilling with bentonite chips. Borings in asphalt shall be abandoned by backfilling with bentonite chips to approximately 6 inches bgs, and the remainder of the borehole will be patched with asphalt cold patch. Borings into concrete are to be avoided if possible to minimize foreign object debris, which can severely damage aircraft. However, if borings are advanced into concrete, the borings will be restored similar to those in asphalt except that concrete will be placed in the borehole to provide as flush a surface as possible.

#### 6.4.2 Monitoring Well Installation, Development, and Sampling

As described in Section 5, existing wells will be utilized to collect groundwater samples, where feasible. HSA limited access drill rigs will be used to install new, 2-inch diameter monitoring wells constructed with Schedule 40 poly-vinyl chloride (PVC), flush-threaded 10-foot sections of riser, 0.010-inch slotted well screen, and a threaded bottom cap. These permanent wells will be installed at boring locations ranging in depth from 80 to 100 feet bgs. If refusal is encountered before the desired depth of sample location, attempts will be made adjacent to the original location. Monitoring wells will be installed in accordance with the Environmental Restoration Program, Air National Guard Investigation Guidance (ANG, 2009). The well screen will "straddle" the water table. A filter pack of 20/40 silica sand will be installed in the annulus around the well screen to a minimum of 2-feet above the well screen. A 2-foot thick bentonite seal will be placed above the filter sand and hydrated with distilled water. Bentonite grout will be placed in the well annulus from the top of the bentonite seal to ground surface. The bentonite grout will be allowed to set for a period of 24-hours prior to well completion. Following installation, the permanent wells will be allowed to equilibrate with the surrounding formation until they contain a sufficient amount of water to fill the required sample containers.

New monitoring wells will be developed no sooner than 24 hours following installation by pumping and surging using a variable speed submersible pump. Development of wells will be completed per the SOP in **Appendix D** until field parameters have stabilized (See SOP 3-13, **Appendix D**).

Samples will be collected no sooner than 24 hours following development via low-flow sampling methods in accordance with US EPA's Technical Enforcement Guidance Document (TEGD) approved procedures using bladder pumps or peristaltic pumps with disposable tubing (See SOP 3-14, **Appendix D**). Water levels will be measured to the nearest 0.01 inch and recorded. The pump tubing will be PFC free (i.e. HDPE or other PFC free material) and placed a minimum of two feet above the bottom of the monitoring well to prevent disturbance of sediments that may be in the bottom of the well. Groundwater samplers will be decontaminated between boring locations, as warranted (See SOP 3-06, **Appendix D**).

Each sample will be collected into laboratory-supplied bottle ware and submitted to the laboratory for analysis of selected parameters. All sample containers will be PFC free. The laboratory method detection limits for these analytes are presented as an attachment to this work plan. Samples will be packaged on ice and transported daily via overnight commercial carrier under standard chain-of-custody procedures to the laboratory (See SOP 3-04, **Appendix D**).

Field duplicate samples will be collected at a rate of 10% and analyzed for the same parameters as the accompanying samples. Matrix spike and matrix spike duplicates will be collected at the rate of 5% and analyzed for the same parameters as the accompanying samples. Field reagent blanks will accompany each cooler containing samples for PFC analysis and will be analyzed for select PFCs. Equipment blanks will not be prepared or analyzed unless a deviation from this plan requires sample handling using non-dedicated equipment. If non-dedicated sampling equipment is used, equipment blank will be collected and will be analyzed for the same analytes as the groundwater samples. A temperature blank shall be placed in each cooler to ensure that samples are preserved at or below four degrees Celsius during shipment.

### 6.4.3 Sediment and Surface Water

Sediment and surface water samples will be collected in accordance with the SOPs provided in **Appendix D** (See SOP 3-22 and 3-10, respectively). Samples will be collected utilizing PFC-free collection devices. Sediment will be collected from the location closest to the outfall sampling point as possible. Surface water will be collected directly from the outfall. In the event that the outfall is dry, a sample will be collected from the nearest downgradient location where water is present.

Field duplicate samples will be collected at a rate of 10% and analyzed for the same parameters as the accompanying samples. Matrix spike and matrix spike duplicates will be collected at the rate of 5% and analyzed for the same parameters as the accompanying samples. Field reagent blanks will accompany each cooler containing samples for PFC analysis and will be analyzed for select PFCs. Equipment blanks will not be prepared or analyzed unless a deviation from this plan requires sample handling using non-dedicated equipment. If non-dedicated sampling equipment is used, equipment blank will be collected and will be analyzed for the same analytes as the groundwater samples. A temperature blank shall be placed in each cooler to ensure that samples are preserved at or below four degrees Celsius during shipment.

## 6.5 Sample Identification

The sample identification number will consist of an alphanumeric designation related to the installation, site, event, media type, and consecutive number, according to the following conventions:

#### **Soil Samples:**

- Soil Sample Numbers: TU-xxx-yyzz-depth.
- Installation: TU = Tucson ANGB.
- Site Code xxx = site identification (ID) codes are located in **Table 4**.
- Media Type yy: SS = Surface Soil (0-1 ft bgs) or SB = Subsurface Soil.
- Consecutive Number zz: 01, 02, 03, etc.
- Depth: Depth below ground surface in feet. Note that the depth for surface soil samples will be “01” indicating that the sample was taken from 0-1 foot.
- Sample Type: D for duplicate.

#### **Groundwater, Surface Water and Sediment Samples:**

- Groundwater, Surface Water and Sediment Sample Number: TU-xxx-yyzz.
- Installation: Tucson ANGB = TU.
- Site Code xxx = site identification (ID) codes are located in **Table 4**.
- Media Type yy: MW = Groundwater, SD = Sediment, SW = Surface Water.
- Consecutive Number zz: 01, 02, 03, etc.
- Sample Type: D for duplicate.

The sample identification numbers for the first subsurface soil and groundwater samples at Building 50 – Fire Station (site ID 50) will be TU-50-SB01-05, indicating that the sample was collected from 5 ft bgs and TU-50-MW01, respectively. Duplicate sample identification numbers will be followed with a “D”.

Field reagent blank (FRB) and equipment blank (EB) QC samples will be identified as follows:

- Field Reagent Blanks = TU-FRB-date (mmddyy), and
- Equipment Blanks = TU-EB-date (mmddyy).

## 6.6 Analyses and Quality Assurance/Quality Control

Samples will be analyzed for the six US EPA UCMR-3 identified PFCs (PFOS; PFOA; PFNA; PFHxS; PFHpA; and PFBS) using the US EPA Method 537 (modified) as outlined in the **Appendix C**. Samples will be shipped to Eurofins Lancaster Laboratory (Eurofins), a DoD approved laboratory that is experienced in handling environmental samples, is Environmental Laboratory Approval Program (ELAP) certified for PFC analyses, and meets DoD Installation Restoration QA Program requirements. The laboratory will provide analytical results within 30 days of sample receipt. Data validation/review will be conducted on laboratory results by AECOM chemists in accordance with procedures specified in **Appendix C**.

The quality of analytical data will be assessed through the collection and analysis of field and laboratory QC samples. QC samples will be used to check the sampling methodology and analytical precision, accuracy and representativeness as provided in more detail in **Appendix C** of this work plan.

## 6.7 Health and Safety Requirements

Health and safety requirements for SI field activities are provided in the APP (**Appendix E**). Field personnel will wear PFC-free clothing and Level D personal protective equipment. Detailed job hazard analyses identifying the physical, chemical, and biological hazards that may be encountered at the site and the associated mitigation methods are presented in the APP.

All on-site personnel who may be exposed to hazardous conditions will be required to meet training requirements identified in Federal Regulation 29 CFR 1910.120 (HAZWOPER). At least two personnel trained in first aid and cardiopulmonary resuscitation (CPR) will be onsite during field activities. Training certificates for personnel (HAZWOPER 40-hour training; current HAZWOPER 8-hour refresher training; and first aid/CPR) will be maintained onsite by the Field Manager.

Personnel and visitors who enter the site will be required to review the APP and sign the acknowledgement form, and site workers will be required to sign the daily tailgate safety meeting form. Safety issues that arise during implementation of site activities will be addressed during tailgate safety meetings held daily before the workday and will be documented in the daily tailgate safety meeting form.

## 6.8 Data Management

Field and analytical data collected during this project are critical to site characterization efforts and the establishment of a conceptual site model (CSM). Investigation data will be recorded and maintained for future use and reporting. Logbooks and field data sheets will be used to record data collection activities. Project documentation will be collected and managed onsite during the field activities. Field and laboratory data will be recorded and entered into a computerized submission format in accordance with NGB/A70 10-01, Policy on Environmental Resources Program Information Management System (ERPIMS), including the Data Loading Handbook. The field and analytical laboratory data required to complete Group 1, 2 and 3 data tables and satisfy ERPToolsX field, record, and submission data validity requirements will be collected including:

- Sample site information;
- Soil boring/sample location coordinates (latitude, longitude, elevation);

- Lithology/stratigraphy/hydrogeology;
- Temporary/permanent groundwater monitoring well construction details;
- Field tests (e.g., water level, temperature, pH, specific conductivity, turbidity);
- Sample type (e.g., normal, field QC), matrix, sampling method, collection date/time, depth interval;
- Sample handling, preparation and analyses, and
- Sample results (analyte concentrations, dilutions, data qualifiers, method reporting/detection limits).

Samples collected during the SI will be analyzed by Eurofins using methods identified in the QAPP (**Appendix C**). Sample collection, data analysis, and data reporting are addressed in the QAPP (**Appendix C**).

Surveying of sampling locations will be performed, collecting at a minimum samples X and Y locations. Survey data will be compliant with NGB/A7O 11-01, Policy on Collection of Digital Spatial Data for Monitoring Wells During Environmental Investigations at Air National Guard Sites (Supplements A7CV 07-03, 15 Aug 2007, same subject) (NGB/A7O 11-01, 2011). As outlined by this policy, well features will be collected in the applicable State Plane Coordinate System zone using North American Datum of 1983 as the Earth datum and units of English feet (or as defined by the base Common Installation Picture if it has been developed). GIS data will be compliant with the latest ANG spatial data requirements, currently NGB/A7O 14-01, Requirements for Geospatial Data Deliverables.

## 6.9 IDW Management

Investigation Derived Waste (IDW) generated during SI activities (e.g., soil cuttings and decontamination/purge water) will be containerized in correctly labeled 55-gallon drums. IDW will be sampled and characterized for waste profiling. IDW will be stored in a fenced in location on base that will be approved by the base EM. The IDW will be labeled and stored within the fenced in area of the facility until it is disposed of by a licensed disposal subcontractor. IDW will be managed in accordance with ANG Policy 05-1 for IDW (ANG, 2009). AECOM will be responsible for arranging transportation and disposal of the IDW.

## 6.10 Documentation

The non-treated field logbook will serve as the primary record of field sampling activities. Entries will be made chronologically and in sufficient detail to allow the writer or a knowledgeable reviewer to reconstruct each day's events (See SOP 3-02, **Appendix D**).

## 6.11 Public Affairs

A project-specific community relations plan is not currently planned for this investigation, but may be implemented if sufficient interest from the community is realized. AECOM will not disclose any data resulting from the SI to the news media, the public, regulatory agencies, or any other non-project-involved personnel. Requests for information from the press or public will be referred to the Tucson ANG public affairs office.

## 6.12 SI Report

AECOM will prepare a Draft, Draft Final, and Final PFC SI Report for Tucson ANGB. The PFC SI Report will be comprehensive describing the site history and source of COPC, site setting, current and future land use, scope of project investigation activities, investigation results, updated CSM, the rationale and data used to arrive at conclusions/recommendations concerning contaminants, and the QA/QC procedures utilized to check assumptions and verify findings. Detailed maps of the site including PRLs, installation boundaries, structures and other site-specific details will be provided. The SI Report will

compile and analyze site data in a clear and concise manner as well as provide defensible justifications for recommendations.

Major elements of the SI Report will include:

## EXECUTIVE SUMMARY

- 1.0 INTRODUCTION
- 2.0 INSTALLATION DESCRIPTION
- 3.0 ENVIRONMENTAL SETTING
- 4.0 FIELD PROGRAM
  - 4.1 General Approach
  - 4.2 Geophysical Surveys
  - 4.3 Surface Water and Sediment Sampling
  - 4.4 Soil Borings
  - 4.5 Monitoring Well Installation / Groundwater Sampling
- 5.0 INVESTIGATION RESULTS
  - 5.1 PRLs (A-X)
    - 5.1.1 Field activities
    - 5.1.2 Investigation Results
    - 5.1.3 Conclusions and Recommendations
  - 5.Y Investigation-Derived Waste Management
  - 5.Z Deviations from the Work Plan
- 6.0 CONCLUSIONS- Summary
- 7.0 RECOMMENDATIONS- Summary
- 8.0 REFERENCES

APPENDICES (as warranted)

## APPENDIX A: FIELD DOCUMENTATION

A-1: BORING/WELL LOGS AND WELL CONSTRUCTION DIAGRAMS

A-2: MONITORING WELL SAMPLING FORMS

A-3: INSTRUMENT CALIBRATION

A-4: FIELD LOGBOOK AND MISCELLANEOUS FORMS

## APPENDIX B: ANALYTICAL DATA VALIDATION REPORTS AND LABORATORY DATA REPORTS

## APPENDIX C: INVESTIGATION-DERIVED WASTE MANAGEMENT



## 6.13 Schedule

The following table summarizes the planned schedule for the completion of key project activities.

**Table 5. Proposed Schedule - Tucson ANGB**

Activities	Scheduled
Field Work Mobilization	Within 30 days of the approval of the Final Work Plan
Completion of the Field Work	Within 30 days of mobilization
Receipt of the Laboratory Data	30 days after demobilization
Prepare and Submit Draft SI Report	60 days after receipt of the laboratory data
Prepare and Submit Draft Final SI Report	30 days after receipt of review comments
Prepare and Submit Final SI Report	30 days after receipt of Regulatory review comments

## 7. References

ANG, 2006. Final Environmental Baseline Survey, 162<sup>nd</sup> Fighter Wing, Arizona Air National Guard. August.

Air National Guard Readiness Center. 2009. Air National Guard, Environmental Restoration Program, Investigation Guidance. September.

Anderson, H. R., Long, C. G., Porter, R. C., and Anderson, J.K. 2016. Occurrence of Select Perfluoroalkyl Substances at U.S. Air Force Aqueous Film-forming Foam release Sites Other than Fire-Training Areas: Field-validation of Critical Fate and Transport Properties. *Chemosphere* 150: 678-685.

Backe, W. J., Day, T. C., and Field, J. A. 2013. Zwitterionic, Cationic, and Anionic Fluorinated Chemicals in Aqueous Film Forming Foam Formulations and Groundwater from U.S. Military Bases by Nonaqueous Large-Volume Injection HPLC-MS/MS. *Environmental Science and Technology* 47: 5226-5234.

BB&E, 2016. Perfluorinated Compounds Preliminary Assessment Site Visit Report. Tucson Air National Guard Base, 162nd Fighter Wing, Tucson, Arizona. May.

Department of the US Air Force, 2012. Interim Air Force Guidance on Sampling and Response Actions for Perfluorinated Compounds at Active and BRAC Installations. 27 August.

Department of the US Air Force, 2014. Incorporating Change 1, 18 Apr 2016. Air Force Instruction 32-7020, The Environmental Restoration Program AFI32-7020. 7 November.

Department of Defense, 2009. Department of Defense Instruction, Emerging Contaminants. DoDI 4715.18. 11 June.

Engineering-Science, Inc., 1993. Final Site Investigation Report, Vol I, 110<sup>th</sup> Fighter Group, Michigan Air National Guard, W.K Kellogg Memorial Airport, Battle Creek, Michigan. November.

Harding-Marjanovic, K. C., Houtz, E. F., Yi, S., Field, J. A., and Sedlak, D. L., and Alvarez-Cohen, L. 2015. Aerobic Biotransformation of Fluorotelomer Thioether Amido Sulfonate (Lodyne) in AFFF-Amended Microcosms. *Environmental Science and Technology* 49: 7666-7674.

Hazardous Materials Technical Center (HMTCC), 1987. Installation Restoration Program, Preliminary Assessment – Records Search. October.

NGB/A7O 10-01, 2010. Policy on Environmental Resources Program Information Management System (ERPIMS), September.

NGB/A7O 11-01, 2011. Policy on Collection of Digital Spatial Data for Monitoring Wells During Environmental Investigations at Air National Guard Sites (Supplements A7CV 07-03, 15 Aug 2007, same subject). April.

NGB/A7O 14-01, 2014. Requirements for Geospatial Data Deliverables. March.

Secretary of the Air Force/Installation, Environment and Energy (SAF/IE). SAF/IE Policy on Perfluorinated Compounds (PFCs) of Concern. August 11, 2016

Tetra Tech, 2015. Final Groundwater Monitoring Program Work Plan, Environmental Restoration Program. 162<sup>nd</sup> Wing, Arizona Air National Guard, Tucson International Airport Superfund Site, Tucson, Arizona. May 2015.

United States Department of Agriculture, Natural Resources Conservation Service (USDA NRCS), 2017. Web Soil Service. <http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx> as accessed on 18 April 2017.

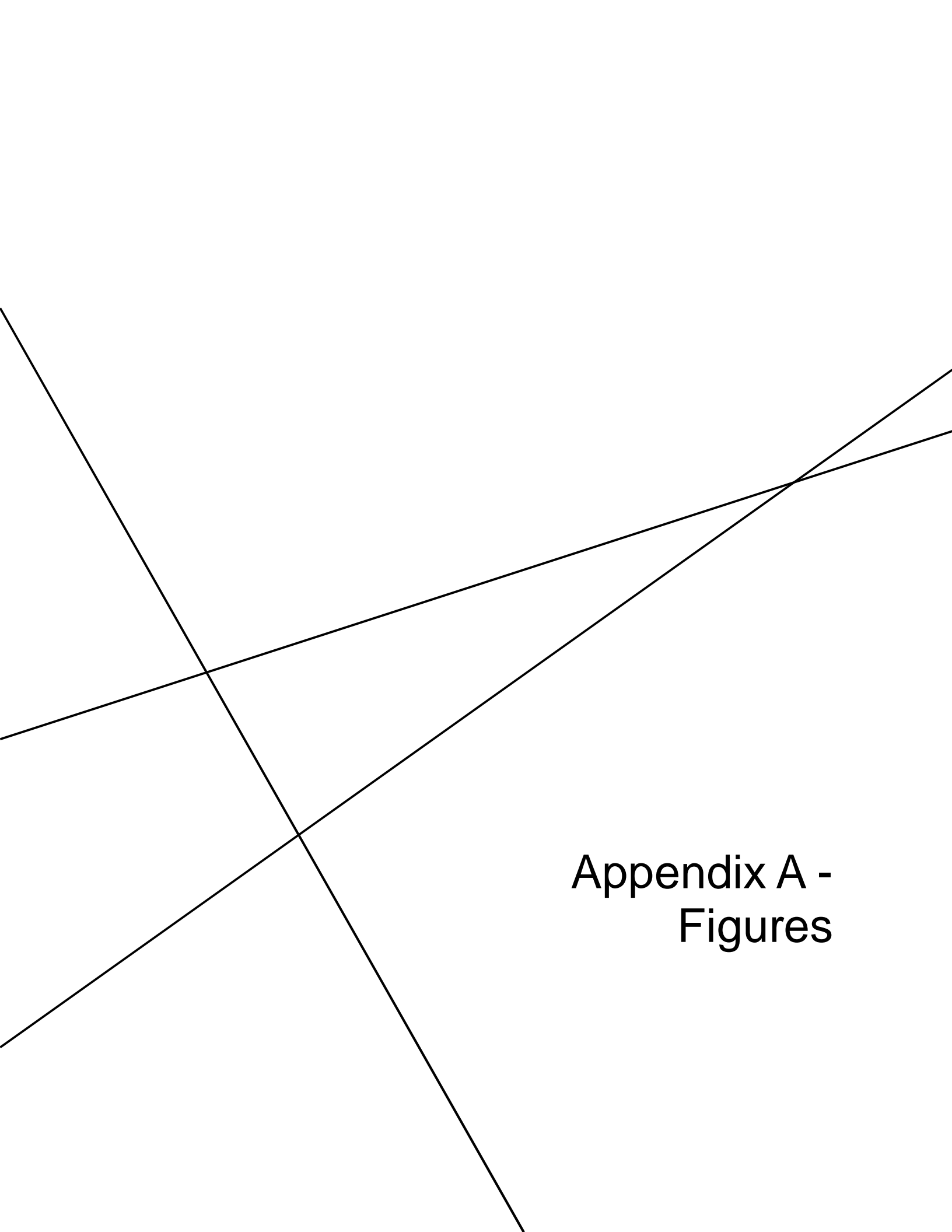
US EPA, 2012. Third Unregulated Contaminant Monitoring Rule (UCMR-3).  
<https://www.epa.gov/dwucmr/third-unregulated-contaminant-monitoring-rule>. May.

US EPA, 2016a. Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA) – May 2016.  
[https://www.epa.gov/sites/production/files/2016-05/documents/pfoa\\_health\\_advisory\\_final\\_508.pdf](https://www.epa.gov/sites/production/files/2016-05/documents/pfoa_health_advisory_final_508.pdf) as  
accessed on 4 January 2017.

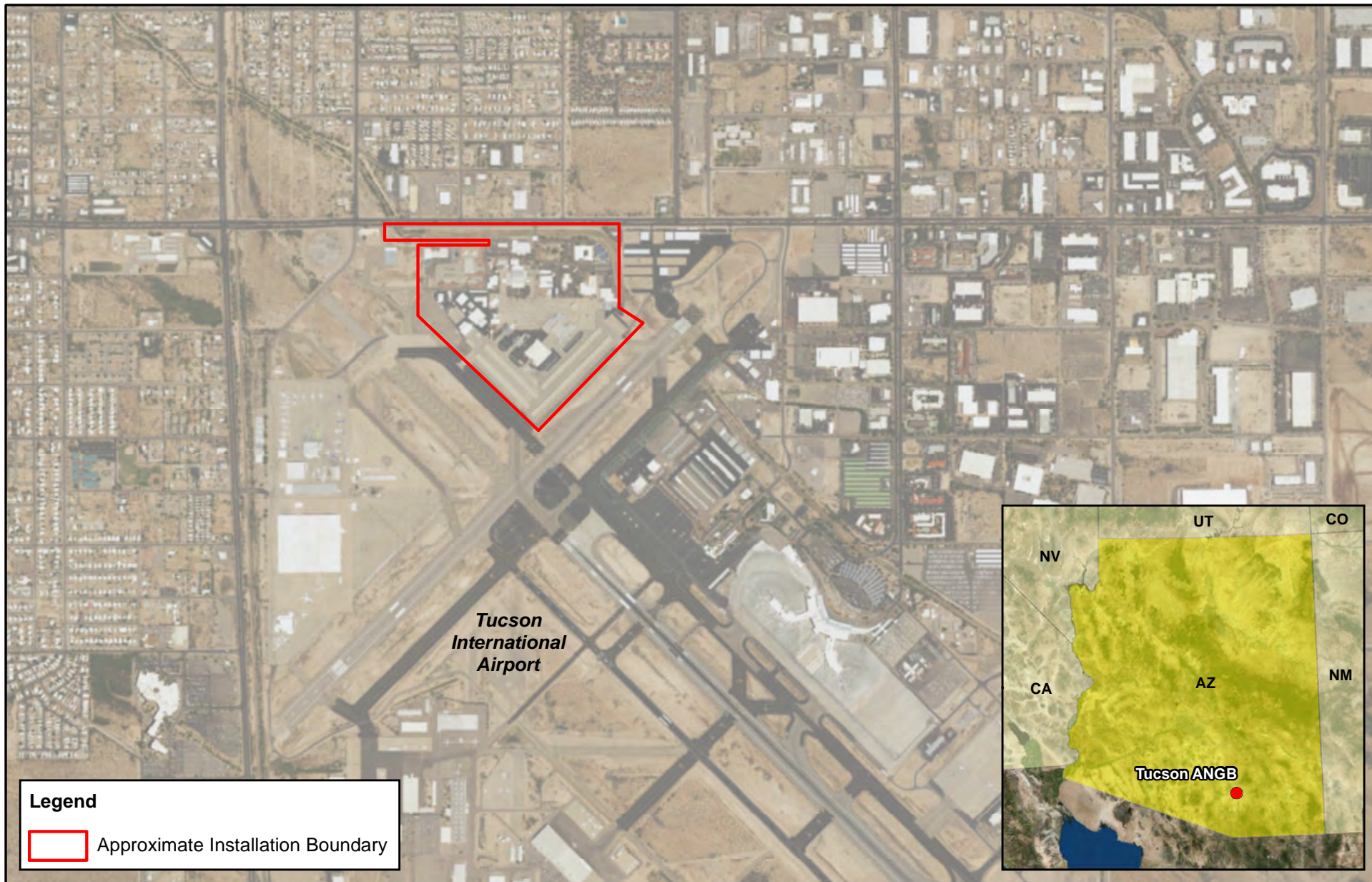
US EPA, 2016b. Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS) – May 2016.  
[https://www.epa.gov/sites/production/files/2016-05/documents/pfos\\_health\\_advisory\\_final\\_508.pdf](https://www.epa.gov/sites/production/files/2016-05/documents/pfos_health_advisory_final_508.pdf) as  
accessed on 4 January 2017.

United States Fish and Wildlife Service (USFWS), 2017. Information for Planning and Conservation  
Resource List: Explore Pima County as accessed on 18 April 2017.

Weber, A. K., Barber, L. B., LeBlanc, D. R., Sunderland, E. M., and Vecitis, C. D. 2017. Geochemical and  
Hydrologic Factors Controlling Subsurface Transport of Poly- and Perfluoroalkyl Substances, Cape Cod,  
Massachusetts. Environmental Science and Technology 51: 4269-4279.



## Appendix A - Figures



**Legend**

Approximate Installation Boundary

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Approved: TC 4/21/2017

Project No.: 60520893

N  
W E  
S

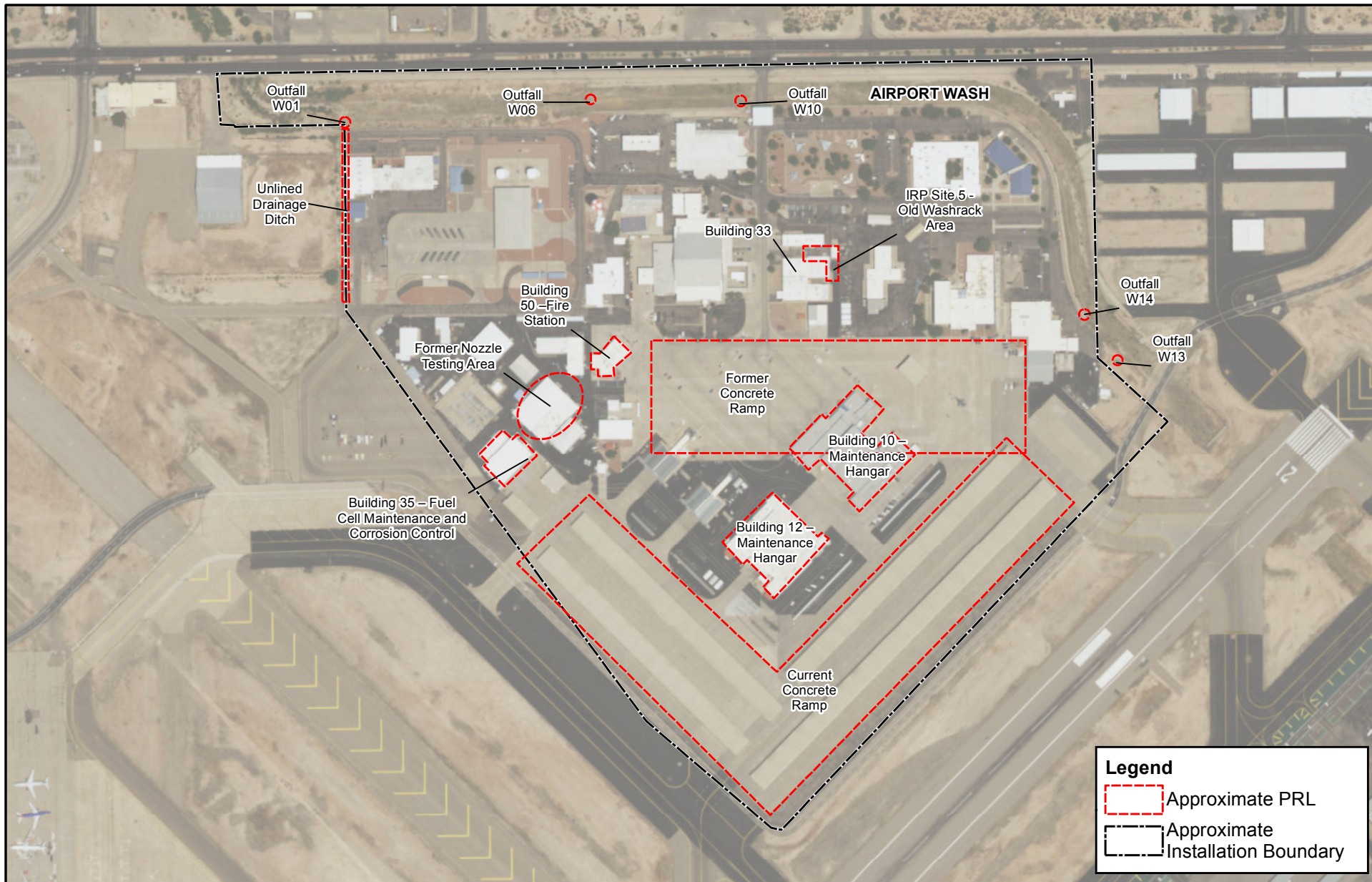
0 1,000 2,000  
Feet

Figure 1-1  
**Tucson ANG B Location**

Arizona ANG Perfluorinated Compounds  
Site Inspection Work Plan

Tucson, Arizona





**Legend**

Approximate PRL

Approximate Installation Boundary

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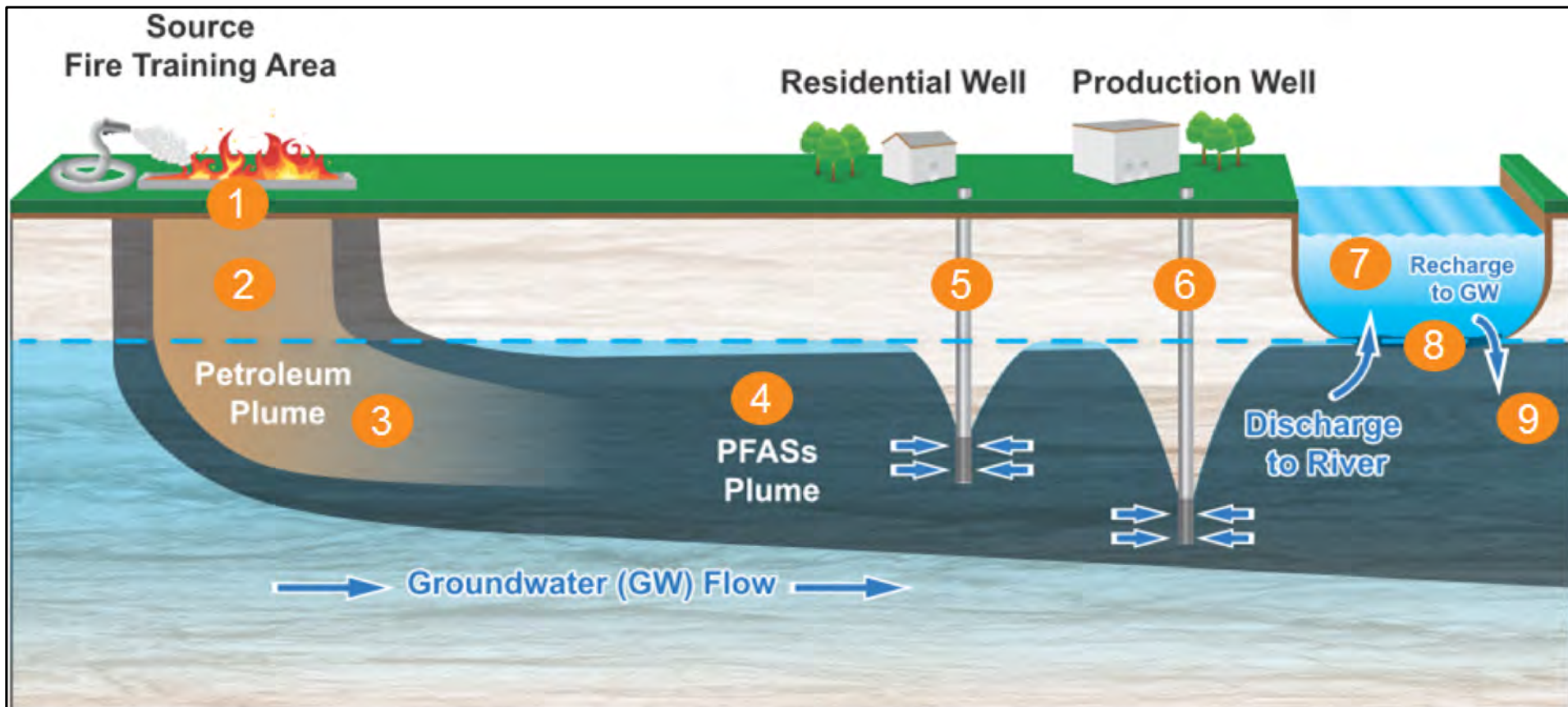
 Feet

Figure 2-1  
**Tucson ANGB Potential Release Locations**

Arizona ANG Perfluorinated Compounds  
 Site Inspection Work Plan

Tucson, Arizona



- |                   |                                 |  |
|-------------------|---------------------------------|--|
| ① Surface Soil    | ④ Downgradient GW Containment   | ⑦ Surface Water                        |
| ② Subsurface Soil | ⑤ Residential Well GW Treatment | ⑧ Sediment                             |
| ③ Source Area GW  | ⑥ Production Well GW Treatment  | ⑨ Offsite GW Impacted by Surface Water |

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*Not to Scale*

Figure 4-1  
**Conceptual AFFF Site Model**

Arizona ANG Perfluorinated Compounds  
Site Inspection Work Plan

Tucson, Arizona





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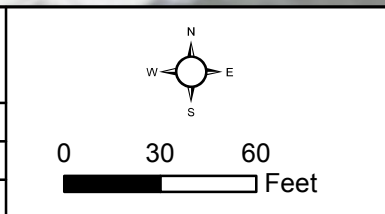


Figure 5-1  
**Building 50 -Fire Station Sample Locations**  
Arizona ANG Perfluorinated Compounds  
Site Inspection Work Plan  
Tucson, Arizona





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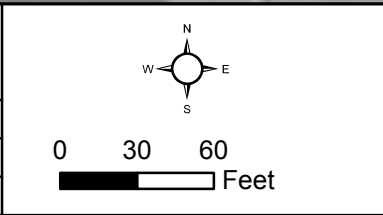
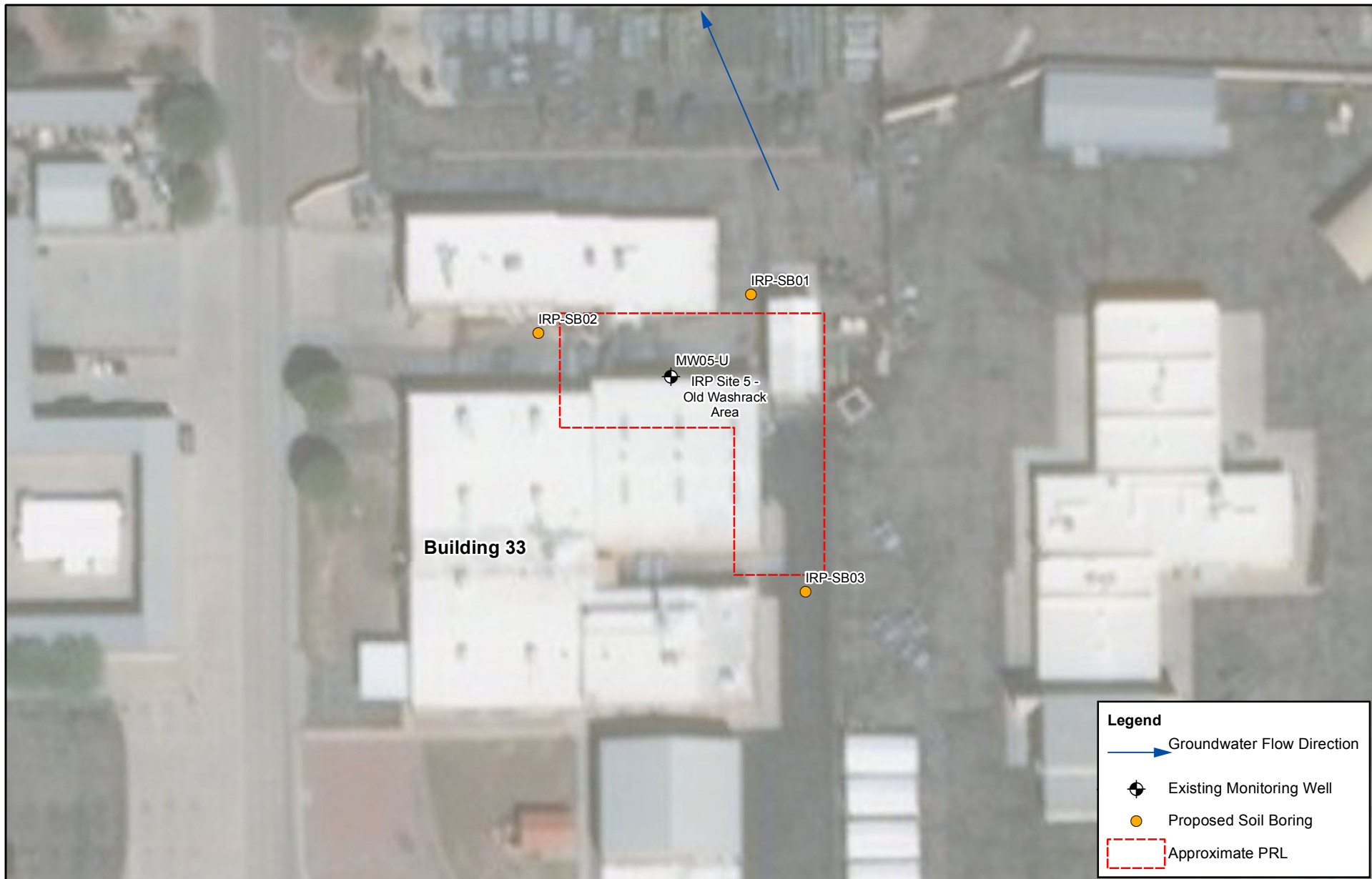






Figure 5-2  
**Building 35 – Fuel Cell Maintenance and Corrosion Control Sample Locations**  
  
Arizona ANG Perfluorinated Compounds  
Site Inspection Work Plan  
  
Tucson, Arizona



**Legend**

-  Groundwater Flow Direction
-  Existing Monitoring Well
-  Proposed Soil Boring
-  Approximate PRL

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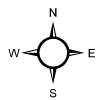

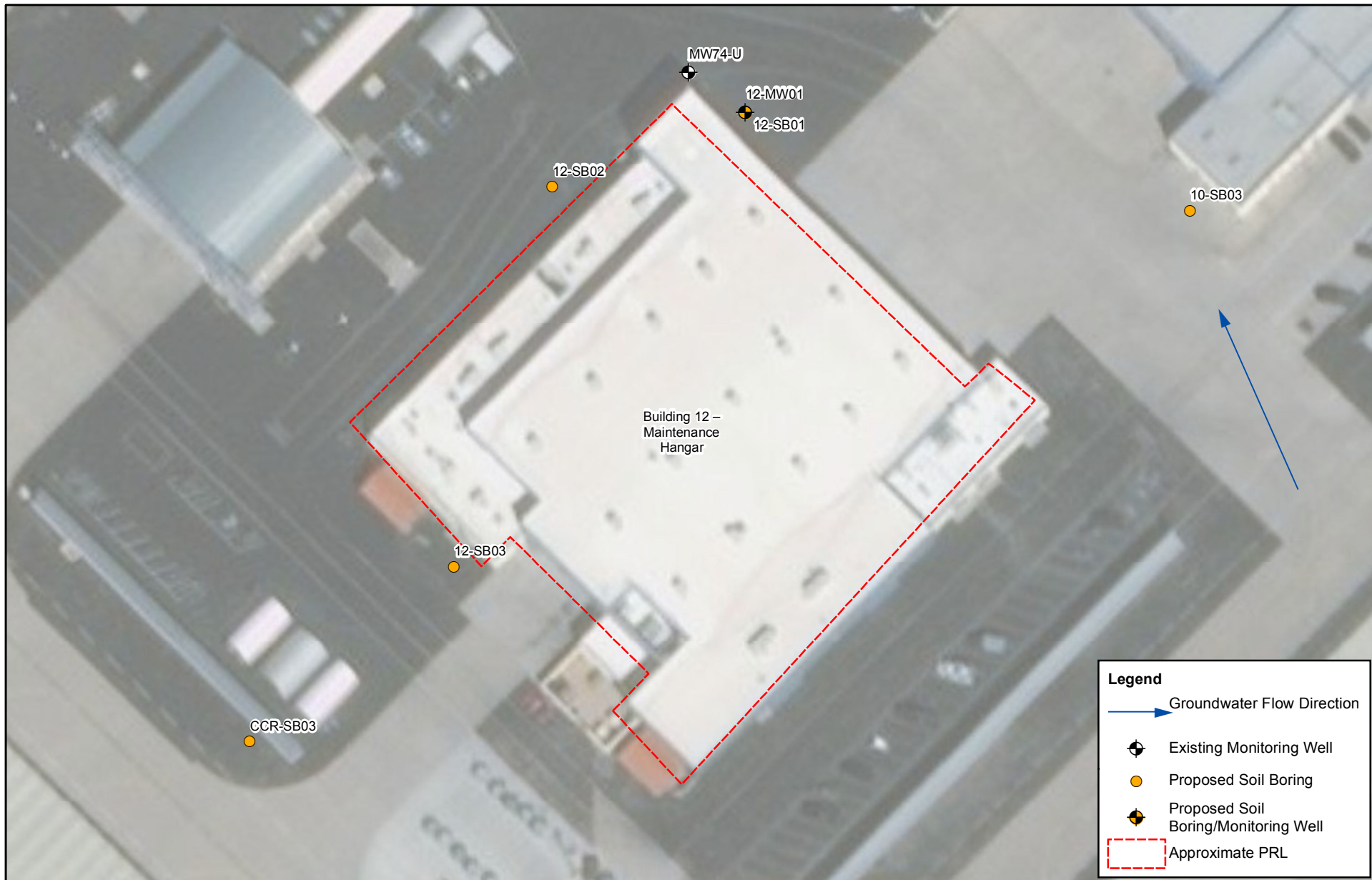
  
 0      30      60  
 Feet

Figure 5-3  
**IRP Site 5 - Old Washrack Area Sample Locations**  
 Arizona ANG Perfluorinated Compounds  
 Site Inspection Work Plan  
 Tucson, Arizona



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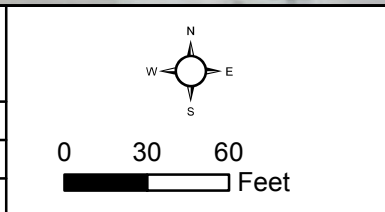
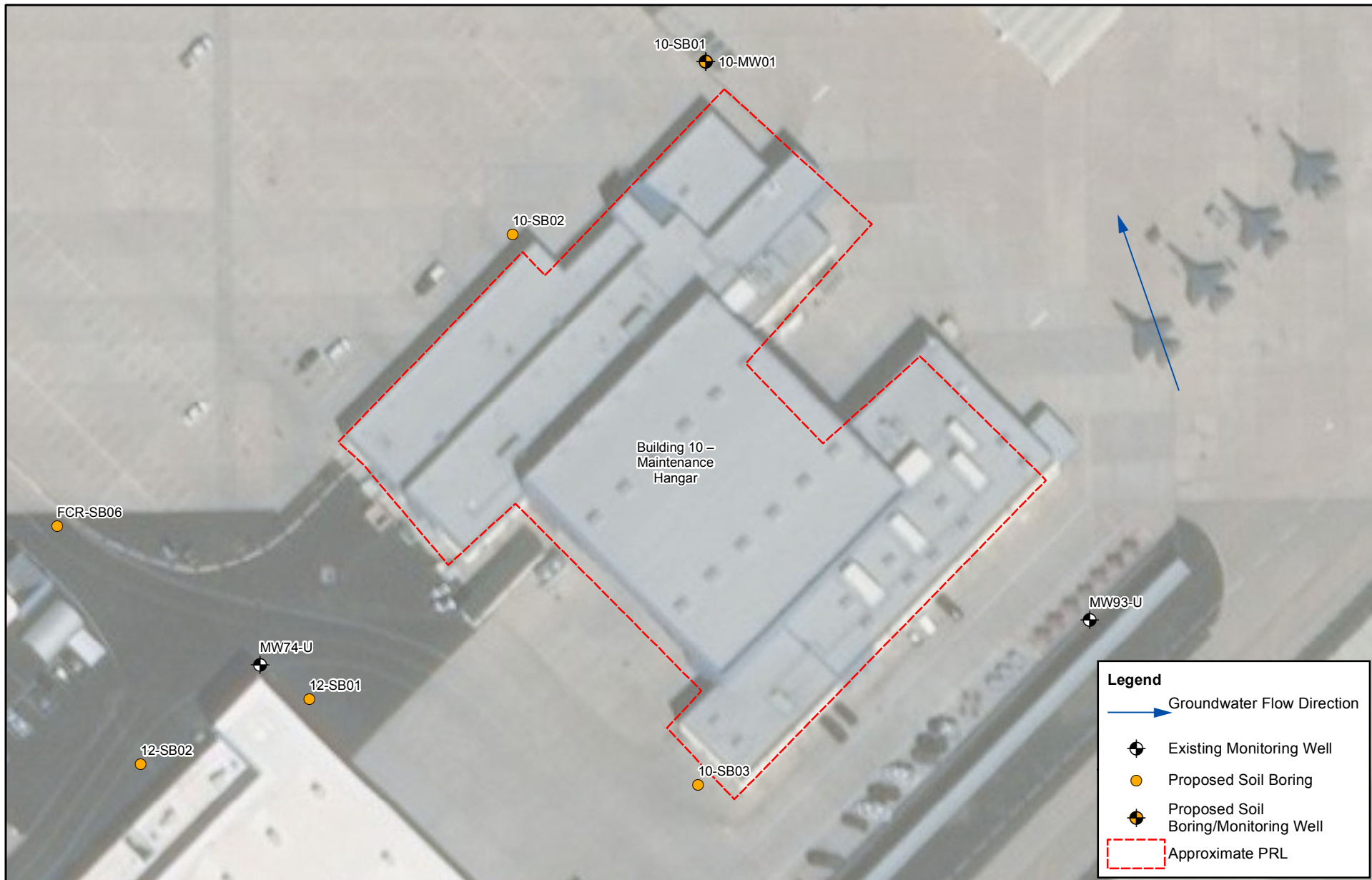


Figure 5-4  
**Building 12 – Maintenance Hangar Sample Locations**  
Arizona ANG Perfluorinated Compounds  
Site Inspection Work Plan  
Tucson, Arizona





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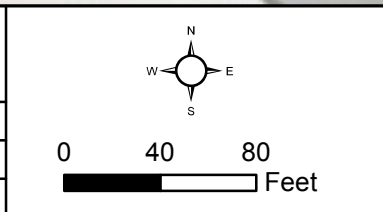


Figure 5-5  
**Building 10 – Maintenance Hangar Sample Locations**  
 Arizona ANG Perfluorinated Compounds  
 Site Inspection Work Plan  
 Tucson, Arizona



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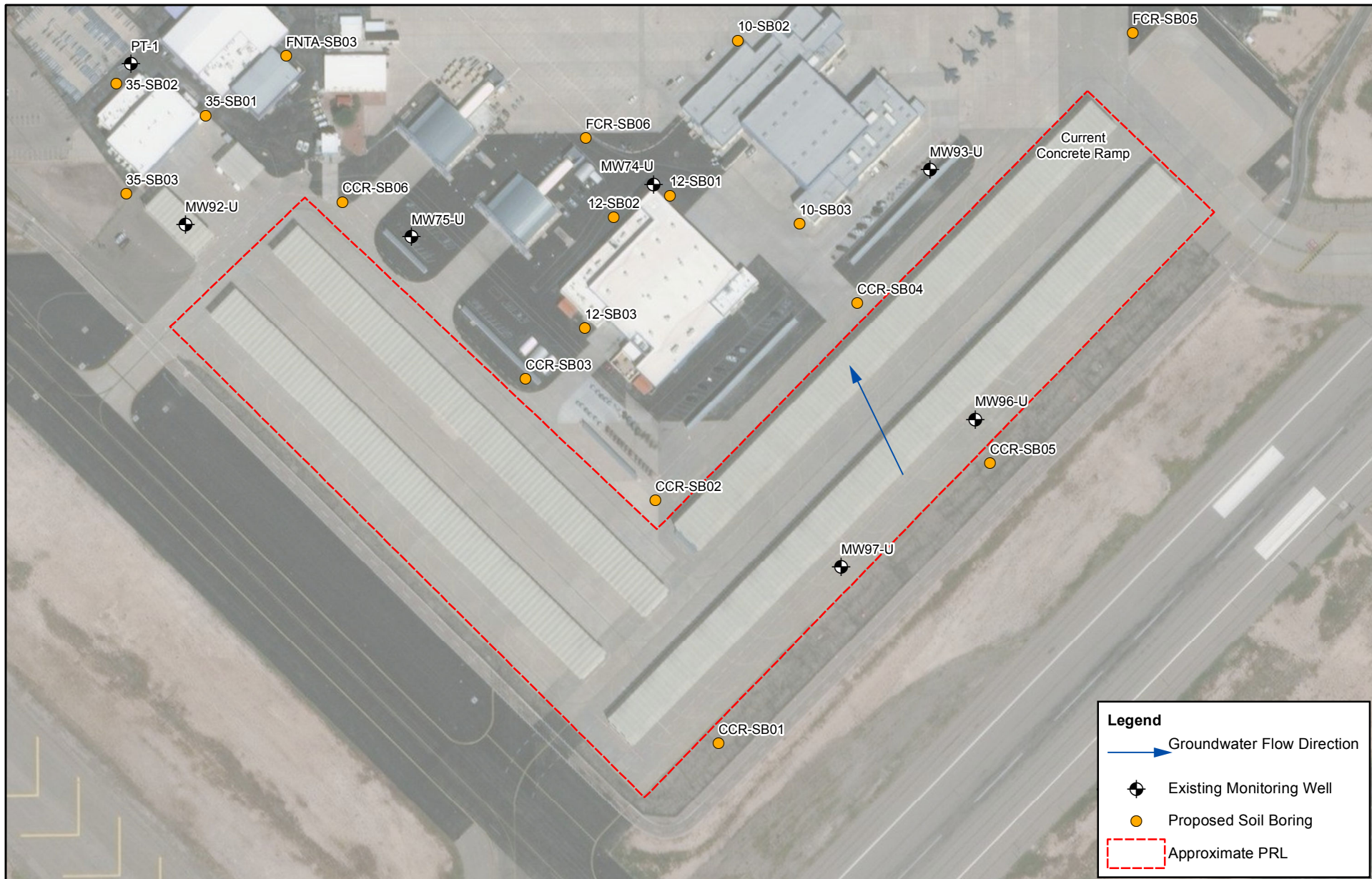
Project No.: 60520893

0 80 160 Feet





North arrow pointing up (N), with W, E, and S also indicated.

Figure 5-6  
**Former Concrete Ramp Sample Locations**  
 Arizona ANG Perfluorinated Compounds  
 Site Inspection Work Plan  
 Tucson, Arizona





**Legend**

-  Groundwater Flow Direction
-  Existing Monitoring Well
-  Proposed Soil Boring
-  Approximate PRL

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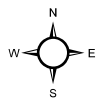

  
 0 125 250  
 Feet

Figure 5-7  
**Current Concrete Ramp Sample Locations**  
 Arizona ANG Perfluorinated Compounds  
 Site Inspection Work Plan  
 Tucson, Arizona



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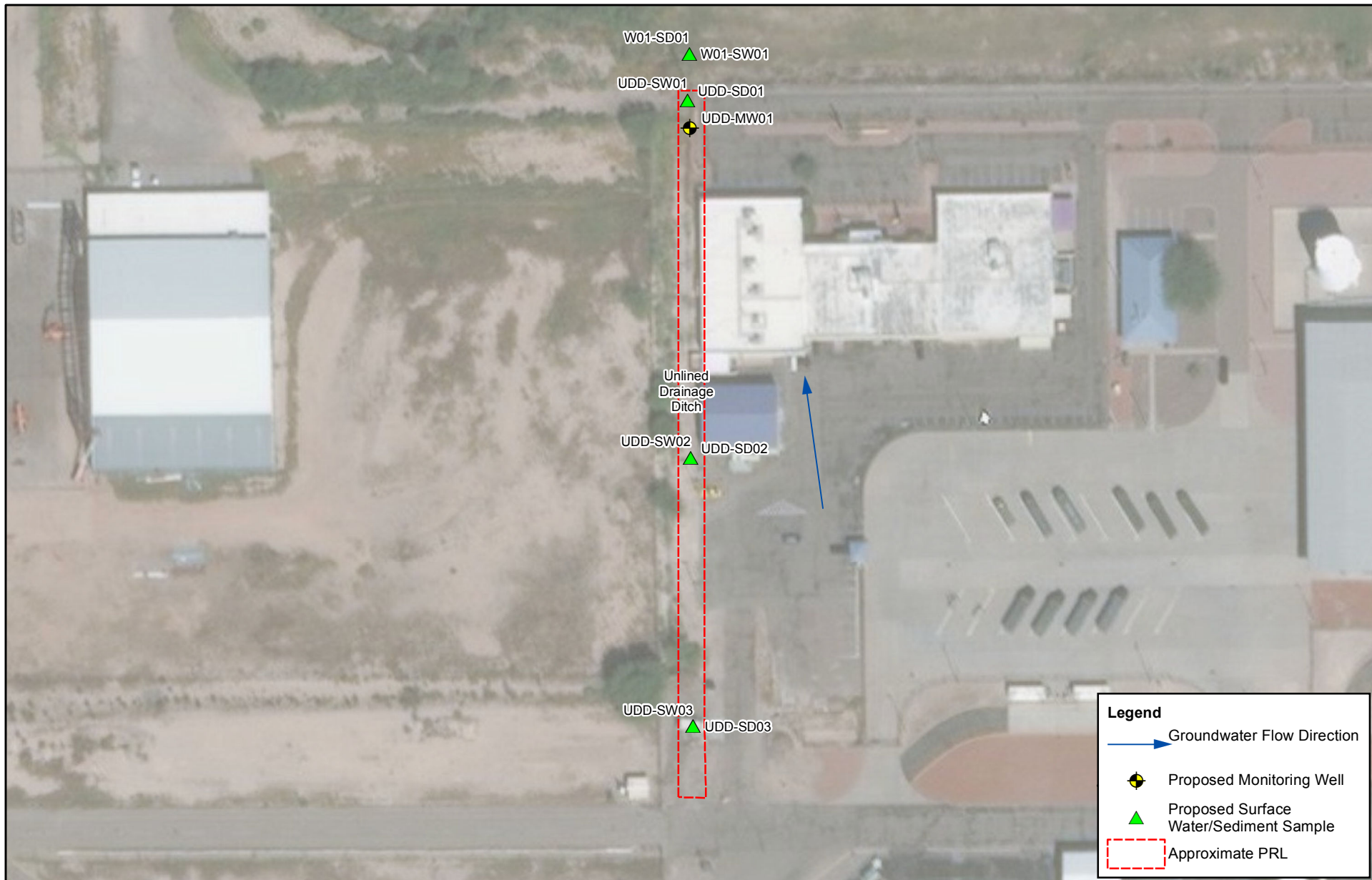
0 30 60  
Feet

Figure 5-8  
**Former Nozzle Testing Area Sample Locations**

Arizona ANG Perfluorinated Compounds  
Site Inspection Work Plan

Tucson, Arizona





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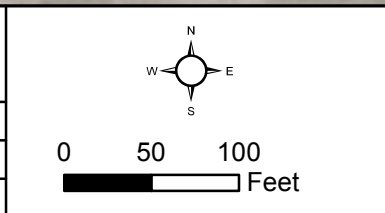
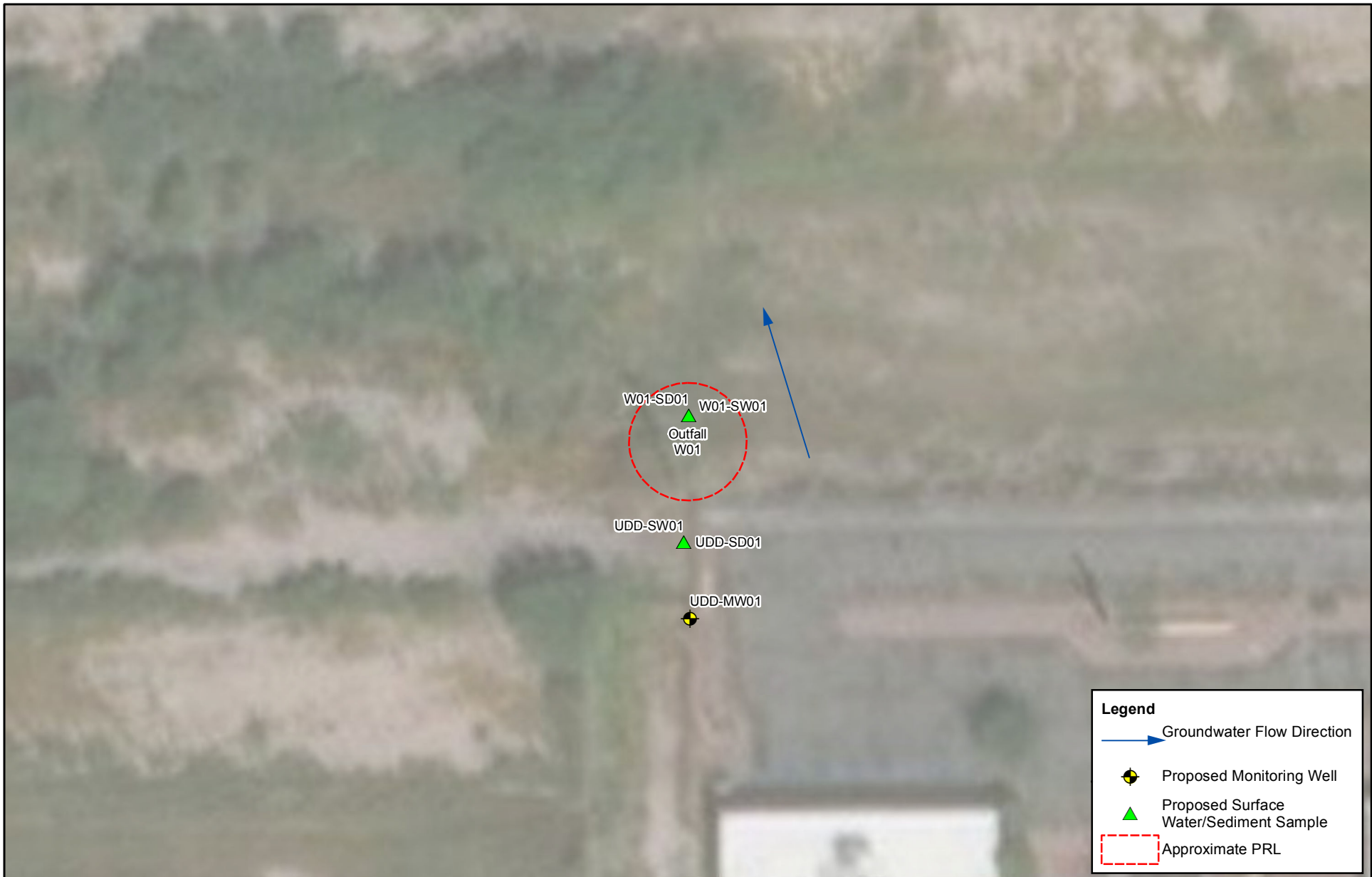


Figure 5-9  
**Unlined Drainage Ditch Sample Locations**  
Arizona ANG Perfluorinated Compounds  
Site Inspection Work Plan  
Tucson, Arizona





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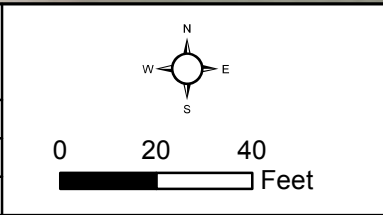


Figure 5-10  
**Outfall W01 Sample Locations**  
Arizona ANG Perfluorinated Compounds  
Site Inspection Work Plan  
Tucson, Arizona



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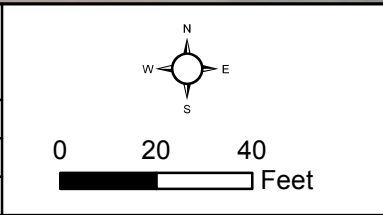


Figure 5-11  
**Outfall W06 Sample Locations**  
Arizona ANG Perfluorinated Compounds  
Site Inspection Work Plan  
Tucson, Arizona



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Project No.:	60520893

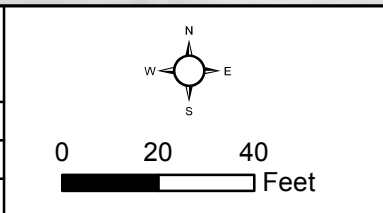


Figure 5-12  
**Outfall W10 Sample Locations**  
Arizona ANG Perfluorinated Compounds  
Site Inspection Work Plan  
Tucson, Arizona



**Legend**

- Groundwater Flow Direction
- ▲ Proposed Surface Water/Sediment Sample
- Approximate PRL

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N  
 W — — E  
 S

0      20      40  
 Feet

Figure 5-13  
**Outfall W13 Sample Locations**  
 Arizona ANG Perfluorinated Compounds  
 Site Inspection Work Plan  
 Tucson, Arizona





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0 20 40

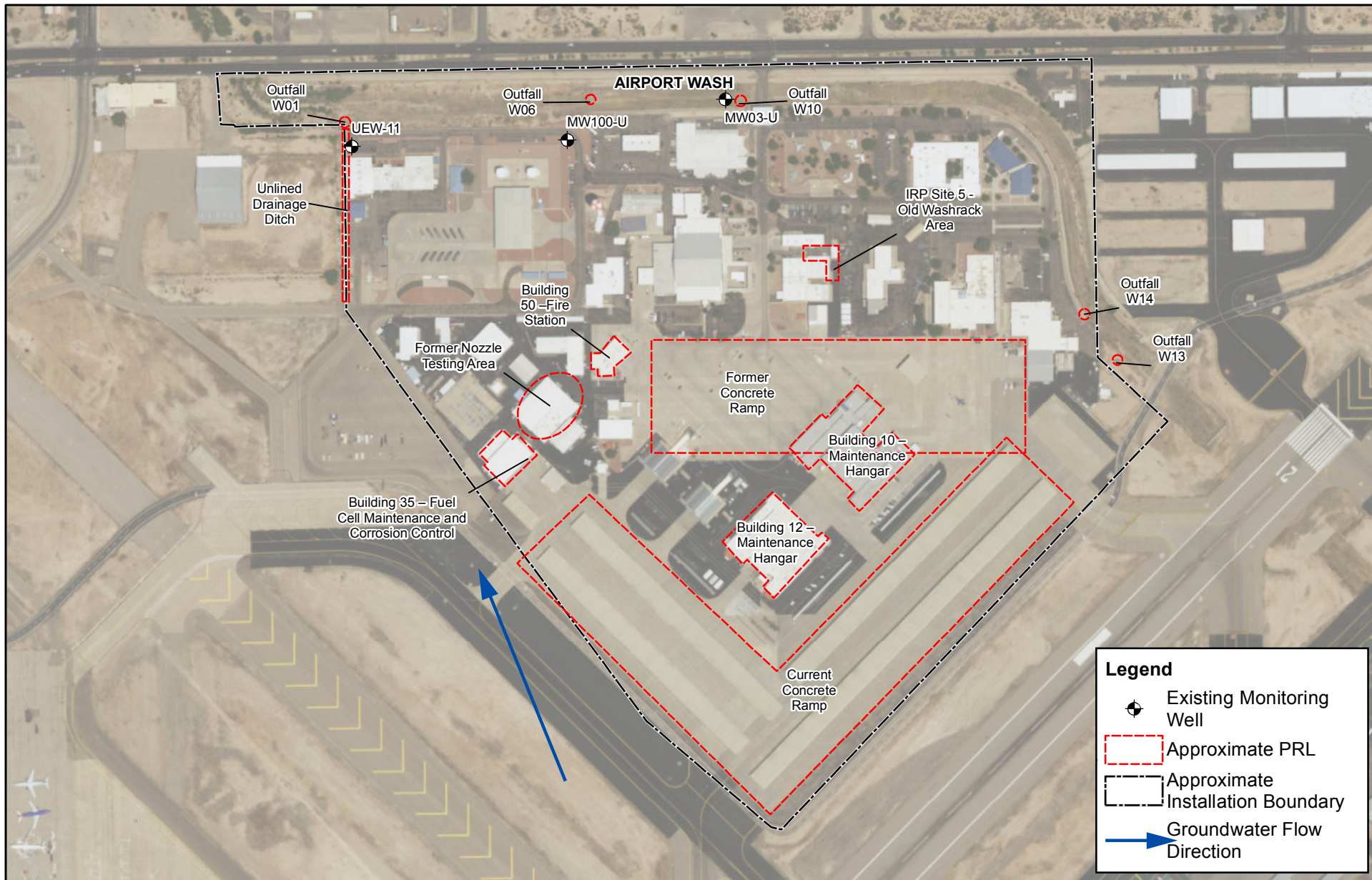
Feet

Figure 5-14

**Outfall W14 Sample Locations**

Arizona ANG Perfluorinated Compounds  
Site Inspection Work Plan

Tucson, Arizona



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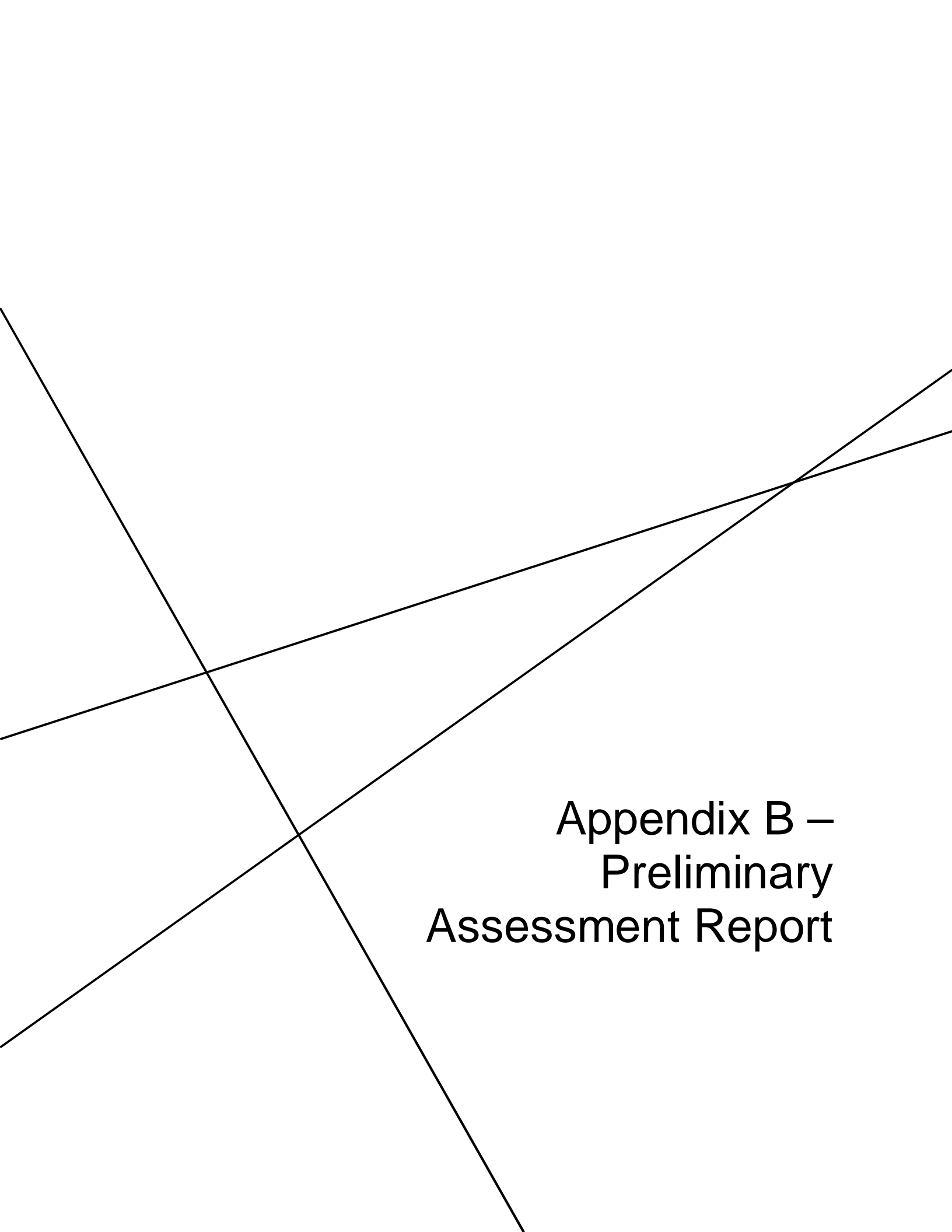


0 230 460  
Feet

Figure 5-15  
**Base Boundary Well Locations**

Arizona ANG Perfluorinated Compounds  
Site Inspection Work Plan

Tucson, Arizona

The background of the page features three thin, black lines that intersect to form a large, irregular triangular shape. One line slopes steeply downwards from the top left towards the bottom right. Another line slopes upwards from the bottom left towards the top right. The third line is more horizontal, sloping slightly upwards from left to right, and intersects the other two lines.

## Appendix B – Preliminary Assessment Report

**FINAL**

**PERFLUORINATED COMPOUNDS PRELIMINARY ASSESSMENT  
SITE VISIT REPORT**

**TUCSON AIR NATIONAL GUARD BASE  
162<sup>ND</sup> WING  
TUCSON, ARIZONA**



**Prepared For:**

**Headquarters Air National Guard  
Joint Base Andrews, Maryland**

**May 2016**



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**FINAL**

**PERFLUORINATED COMPOUNDS PRELIMINARY ASSESSMENT  
SITE VISIT REPORT**

**TUCSON AIR NATIONAL GUARD BASE  
162<sup>ND</sup> WING  
TUCSON, ARIZONA**



**Prepared For:**

**Headquarters Air National Guard  
Joint Base Andrews, Maryland**

**Prepared By:**

**BB&E, Inc.  
May 2016**

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C-3	Stormwater Outfalls and Drainage Area Information
C-4	EDR Potential Environmentally Sensitive Areas Map

## LIST OF ACRONYMS

AFFF	Aqueous Film Forming Foam
ANG	Air National Guard
AOC	Area of Concern
BB&E	BB&E, Inc.
bls	below land surface
DD	Decision Document
EBS	Environmental Baseline Survey
EM	Environmental Manager
FD	Fire Department
FFS	focused feasibility study
ft	feet
FSS	fire suppression system
FTA	Fire Training Area
GPS	Global Positioning System
HEF	high expansion foam
IRP	Installation Restoration Program
JP-4	jet propulsion fuel #4
NFA	No Further Action
NPL	National Priority List
PA	Preliminary Assessment
PFCs	Perfluorinated Compounds
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PHAL	Provisional Health Advisory Levels
POL	petroleum, oil, lubricants
RI	Remedial Investigation
SA	site assessment
s.f.	square foot/feet
SI	Site Investigation
TIA	Tucson International Airport
TCE	trichloroethene
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VOCs	volatile organic compounds

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## **1.0 INTRODUCTION**

A preliminary assessment (PA) site visit was conducted by BB&E, Inc. (BB&E) on January 20, 2016 at the Tucson Air National Guard (ANG) Base (the Base), current home of the 162<sup>nd</sup> Wing in Tucson, Pima County, Arizona. The 162<sup>nd</sup> Wing flies and maintains fighter aircraft. The Tucson ANG Base is located adjacent to and northwest of the Tucson International Airport (TIA). The Base, which has been occupied by the Arizona ANG since 1958, currently occupies 94 acres of the northwestern portion of the airport. The site location is shown on Figure 1. The purpose of the visit was to identify potential sites of historic environmental releases of perfluorinated compounds, specifically from Aqueous Film Forming Foam (AFFF) usage and storage, as shown on Figure 2. Prior to the site visit, BB&E conducted research of any documented Fire Training Areas (FTAs) in operation since 1970, or any other use or release of AFFF in accordance with the Final Perfluorinated Compound (PFC) Preliminary Assessment Work Plan (BB&E, 2015). During the site visit, BB&E conducted personnel interviews, reviewed on-site documentation, and toured each potential site.

Individuals contributing to this PA effort included the following:

Lt Col Michael Knutson – Base Environmental Manager (EM)

Mr. Jorge Valdez – Base Fire Chief

Sections 2.0 and 3.0 of this report outline the potential PFC sources identified on the Base property during the records review and site visit, while Section 4.0 provides conclusions and recommendations for potential follow-on actions. References are included in Section 5.0. Representative photos of the subject sites taken during the site visit are attached as Appendix A. Interview questions and records of communication are presented in Appendix B and other supporting documentation is provided in Appendix C.

### **1.1 Hydrogeologic Setting**

Hydrogeologic information was obtained from the Final Environmental Baseline Survey (EBS) prepared in 2006 (ANG, 2006), the Preliminary Assessment Records Search prepared in 1987



(HMTTC, 1987), and the Site Assessment of a Former Fire Training Area prepared in 1987 (GTI, 1987).

Elevation on the subject property is approximately 2,560 feet above mean sea level. The Base is located in the eastern part of Pima County along a broad alluvial valley known as the Tucson Basin. Tucson Basin deposits include the Pantano Formation, Tinaja Beds, and Fort Lowell Formation (ANG, 2006).

The City of Tucson depends on groundwater for its municipal water, as does the Base. The aquifer system in the Tucson area is composed of basin fill sediments. In the vicinity of the Base, the aquifer system is known as the "regional divided aquifer", consisting of an upper aquifer zone, a lower aquifer zone, and an aquitard which divides the two. The upper aquifer in the vicinity of the Base consists of Recent sands, sandy clays, and clayey sands that extend to a depth of 140 feet below land surface (bls). The lower aquifer is composed of clayey sand with lenses of gravelly sand and sandy clay and extends from approximately 370 feet bls to an unknown depth. Groundwater in the upper aquifer zone occurs under unconfined conditions, and is encountered at a depth of approximately 80 feet bls at the Base. Flow is toward the north-northwest, with a hydraulic gradient of 22 feet per mile (HMTTC, 1987).

The Santa Cruz River, which is dry much of the year, flows northward along the western side of the City of Tucson (approximately 2.4 miles west of the Base) and drains the entire city. Airport Wash, a major tributary of the Santa Cruz River, is also usually dry and forms a part of the northern and eastern boundaries of the Base. Most storm drainage from the Base flows into Airport Wash. Some storm runoff flows into a grate inlet at the wash rack; this runoff is discharged to an oil/water separator (OWS) and then to the sanitary sewer. Approximately 75 percent of the storm runoff which reaches Airport Wash infiltrates into the soil and recharges groundwater supplies (HMTTC, 1987).

The Base uses water supplied by the City of Tucson. Further discussion of onsite and area wells is included in Section 3.2.1.1 of this report.

## **2.0 FIRE TRAINING AREAS**

FTA Areas of Concern (AOCs) are sites where AFFF has been released during fire training activities. The following section includes a description of any fire training AOCs, operational history, waste characteristics, and pathway evaluations. Based on this PA investigation, there is no evidence that an active FTA exists within the footprint of the Tucson ANG Base. There was, however, one historical FTA located within the current Base footprint as described below.

### **2.1 Description, Operational History, and Waste Characteristics**

According to the March 1994 Community Relations Plan, there was one historical FTA that was investigated as part of the Installation Restoration Program (IRP) in the 1980s and 1990s. Appendix C-1 shows the location of the area described below.

#### ***2.1.1 IRP Site 1 – Old Fire Training Area***

Site 1 was located south of Building 49 and east of the former aircraft parking apron. From the late 1950s until 1965, fire training exercises were conducted at three open, unlined pits. An estimate 12,500 gallons of jet fuel #4 (JP-4), solvents, and oils may have been burned at the site (Metcalf & Eddy, Inc., 1993). The site is currently covered by pavement and asphalt.

A site assessment (SA) was completed in October 1987 prior to the expansion of the flight apron. Based on the findings of the SA, no further investigations were performed at the site during the remedial investigation (RI). Two groundwater monitoring wells were installed downgradient and sampled in 1989 for several contaminants. None were found, and no further action was recommended during the RI.

Based on the dates of use of this area as an FTA (prior to 1970), it is not expected that AFFF was used at this location.

### **3.0 NON-FIRE TRAINING AREAS**

Non-FTA AOCs are sites where AFFF has been stored or released and may include crash sites, hangars, fuel spill areas, hazardous waste storage facilities, firefighting equipment testing areas, etc.

The following section includes a description of any non-fire training AOCs identified during this PA effort including operational history, waste characteristics, and pathway evaluations, as applicable.

#### **3.1 AOC Description, Operational History, and Waste Characteristics**

The following are the non-FTA AOCs that were identified during this PA investigation. Appendix A includes photos of these areas from the January 2016 site visit, and Figure 2 depicts the areas. The Fire Chief estimated that AFFF arrived on Base in the early 1980s.

In general, AFFF systems installed in hangars were designed to contain, store, and in the case of system engagement, ultimately discharge the AFFF inside the hangar and then into underground storage systems for containment. The Base has used 3% and 6% AFFF from 3M, Ansul, and Chemguard over the years.

##### ***3.1.1 Building 50 – Fire Station***

The 12,600 square foot (s.f.) Building 50 was constructed in 1993 and has always served as the Fire Department (FD). The following vehicles are currently housed at Building 50:

- One P-19 with a 210-gallon storage capacity
- Two RIVs each with a 56-gallon storage capacity
- One P-22 with a 500-gallon capacity storage
- One foam trailer with a 750-gallon capacity storage

In the 1980s and 1990s, the FD housed 12 vehicles with a combined AFFF storage capacity of 2,100 gallons; a 250-gallon AFFF aboveground storage tank, and several 5-gallon pails in a storage trailer outside the Fire Station. According to the 2006 EBS, there were 50 5-gallon metal

containers and one 55-gallon metal drum of AFFF at Building 50 at the time of the report preparation.

According to Base personnel, the vehicles were manually filled from the 5-gallon pails or gravity-filled from the foam trailer inside the Fire Station. The floor drains in the Fire Station discharge to an oil/water separator before entering the sanitary sewer system. There were no known releases of AFFF at Building 50.

### ***3.1.2 Building 35 – Fuel Cell Maintenance and Corrosion Control***

The 17,211 s.f. Building 35 was constructed in 1989 and serves as the Fuel Cell Maintenance and Corrosion Control Hangar. This building once contained an AFFF fire suppression system (FSS) which has since been converted to high expansion foam (HEF).

No documentation is available for AFFF FSS scheduled tests or for any AFFF discharges. The floor drains inside the building discharge to a 3,000-gallon OWS which is then connected to the sanitary sewer system. However, if there was a release of AFFF at Building 35, it could potentially have drained to the Unlined Drainage Ditch to Outfall W01 (discussed in Sections 3.1.10 and 3.1.11).

### ***3.1.3 IRP Site 5 – Old Washrack Area***

The Old Washrack Area was located on the east corner side of Building 33 which is now the Weapons and Release Systems Shop. From 1959 until 1985, this washrack served the engine shop, other aircraft maintenance shops, and the Fire Station. From 1980 to 1985, the site was connected to an OWS which discharged to the sanitary sewer system. Prior to 1980, the washrack discharged into Airport Wash at the Base gatehouse.

The site was investigated under the IRP where a PA, RI and Focused Feasibility Study (FFS) were completed. Results of the RI indicated that Site 5 was the only on-Base contribution to the larger TCE plume (see Section 2.2.1). Approximately 64 pounds of volatile organic compounds (VOCs) were removed from Site 5 soils by soil vapor extraction in 1997, the same year that groundwater remediation began. A closure report was issued for Site 5 in October 1998 (Environmental Resources Management [ERM], 2007). The RI recommended treatment of soils

at the site, and the groundwater is currently being treated as part of a Base-wide groundwater treatment system currently in place.

#### ***3.1.4 Building 12 – Maintenance Hangar***

The 64,949 s.f. Building 12 was constructed in 1991. It is the only building on Base that currently has an active AFFF FSS. There is a 1,200-gallon AFFF storage tank in Building 12, which sits on a concrete pad in a storage room with concrete floors.

Floor drains in Building 12 are connected to an OWS which discharges to sanitary sewer. There was one known accidental release of AFFF at this building which entered the storm drains outside the building and eventually discharged through Outfall W10 (see Section 3.1.13) into Airport Wash. No documentation was available for this release.

The FSS was tested upon its initial installation. No documentation was available for this test or any other scheduled testing of the AFFF FSS.

#### ***3.1.5 Building 10 – Maintenance Hangar***

The 68,801 s.f. Building 10 was constructed in 1994 and currently has a HEF FSS which was installed between 2004 and 2005. Prior to the retrofit, there was an AFFF FSS. Floor drains in Building 10 are connected to an OWS which discharges to sanitary sewer.

The FSS was tested upon its initial installation. No documentation was available for this test or any other scheduled testing of the AFFF FSS. Any releases of AFFF that may have left the building would have entered the storm drains and eventually Airport Wash via Outfall W10 (see Section 3.1.13).

#### ***3.1.6 Former Concrete Ramp***

Although there are no records of AFFF usage on the former concrete ramp, Base personnel recall portions of the ramp being “foamed” with AFFF numerous times during fuel spills. In addition, there was a civilian aircraft crash circa 1996/1997 in the southeast portion of the ramp where the area was “foamed” with AFFF. Furthermore, the former ramp is adjacent to Buildings 10 and 12 which both had AFFF FSSs. Stormwater in this area would have been routed to Outfalls W10, W13 and W14 (see Sections 3.1.13, 3.1.14, and 3.1.15) into Airport Wash.

### ***3.1.7 Current Concrete Ramp***

At the time of the preparation of the EBS in 2006, the current ramp area was still under consideration for acquisition by the ANG. It was constructed between 1991 and 1994. Although there are no records of AFFF usage on the current concrete ramp, it is adjacent to Buildings 10 and 12 which both had AFFF FSSs. Stormwater in this area is routed to Outfall W14 (see Section 3.1.15) into Airport Wash.

### ***3.1.8 Former Nozzle Testing Area***

This area, currently a paved parking lot, was used for fire equipment testing with AFFF (dates and quantities unknown). The common practice was to wash away AFFF with water into the storm drains. Runoff from the equipment testing would have entered Airport Wash through Outfall W06 and/or Outfall W01 (as described in Sections 3.1.12 and 3.1.11).

### ***3.1.9 Current Nozzle Testing Area***

This area is located on airport property but is used by the Base for fire equipment testing. The common practice was to wash away AFFF with water into the storm drains. Testing was conducted quarterly with AFFF until 2015 when the tests were switched to water only. Runoff from this area flows to Airport Wash through Outfall W01 (as described in Section 3.1.11).

### ***3.1.10 Unlined Drainage Ditch***

This unlined drainage ditch receives stormwater runoff from the southern portion of the Current Concrete Ramp, the Former Nozzle Testing Area, and Building 35 – Fuel Cell Maintenance and Corrosion Control. It typically runs dry.

### ***3.1.11 Outfall W01***

Outfall W01 is located in the northwestern portion of the Base and discharges into Airport Wash. Airport Wash discharges westward to the Santa Cruz River. Outfall W01 receives drainage and runoff from the southern portion of the Current Concrete Ramp and the western portion of the Base including the Current Nozzle Testing Area. Some vegetation was observed in the area of the discharge point into Airport Wash.

### ***3.1.12 Outfall W06***

Outfall W06 is located in the north central portion of the Base and discharges into Airport Wash. Airport Wash discharges westward to the Santa Cruz River. Outfall W06 receives drainage and runoff from western portions of the Base including Building 50 – Fire Station.

### ***3.1.13 Outfall W10***

Outfall W10 is located in the north central portion of the Base adjacent to the Guard House and discharges into Airport Wash. Airport Wash discharges westward to the Santa Cruz River. Outfall W10 receives drainage and runoff from central portions of the Base including Buildings 10 and 12, and Building 9 (Base Supply). It is uncertain if Building 9 contained AFFF but if there were any AFFF releases from Building 9, it would have entered Airport Wash through Outfall W10. The outfall consists of a metal grate with a concrete headwall.

### ***3.1.14 Outfall W13***

Outfall W13 is located in the eastern portion of the Base and discharges into Airport Wash. Airport Wash discharges westward to the Santa Cruz River. Outfall W13 received drainage from the Former Concrete Ramp. The outfall consists of a metal grate with a concrete headwall. Some vegetation was observed in the area of the discharge point into Airport Wash.

### ***3.1.15 Outfall W14***

Outfall W14 is located in the eastern portion of the Base and discharges into Airport Wash. Airport Wash discharges westward to the Santa Cruz River. Outfall W14 received drainage from the Former Concrete Ramp. The outfall consists of a metal grate with a concrete headwall. Some vegetation was observed in the area of the discharge point into Airport Wash.

## **3.2 Pathway and Environmental Hazard Assessment**

The following is a preliminary evaluation of the threats and targets associated with each potential exposure pathway. In their anionic forms, PFOS and PFOA are water soluble and can migrate readily from soil to groundwater. The USEPA has not established PHALs for PFOS and PFOA in soil (USEPA, 2014). The primary exposure pathway for PFOS and PFOA would be the ingestion of contaminated drinking water.

### **3.2.1 Groundwater**

Because the City of Tucson depends exclusively upon aquifers of the Tucson Basin for its drinking water supply, the basin's groundwater system is designated a Sole Source Aquifer under the federal Safe Drinking Water Act. The wells from which the City of Tucson obtains its water are considered "suitable for potable use". The city no longer draws water from wells in the vicinity of the Base due to the presence of trichloroethene (TCE)-contaminated groundwater associated with the TIA Area (TIAA) Superfund Site. However, before the discovery of contaminated groundwater, wells in the vicinity of the Base provided water for approximately 47,000 people. At present, the Base receives its potable water supply from the Tucson Water Company. Use of water supply wells at the Base was discontinued in 1989 due to the presence of the TCE contamination plumes (ANG, 2006).

Groundwater flow at the Base is to the northwest. There is known groundwater contamination which appears to have moved to the northwest over time. Although no source has been identified on the Base, it appears that the Base has contributed to the groundwater contamination (Metcalf & Eddy, 1994).

No documentation was available showing that groundwater at the Base has been tested for PFCs; therefore it is unknown whether PFCs are present in the groundwater. However, based on historical practices, they may be present in the groundwater in the areas of Building 50, Building 35, IRP Site 5, Building 12, Building 10, Former and Current Concrete Ramps, Former and Current Nozzle Testing Areas, and the Unlined Drainage Ditch.

#### **3.2.1.1 Water Wells**

A review of the EDR Radius Map™ Report with Geospatial® dated October 9, 2015 (Appendix C-2) (EDR, 2015) lists a total of 532 wells within a 1.25-mile radius of the Base. One well, located ¼-mile northwest of the Base, is listed as a public water supply serving a population of 600 for the Arizona ANG (ID AZ0420418). However, the well status is listed as closed. Twenty-six wells are listed in the United States Geological Survey (USGS) database under the USGS Arizona Water Science Center. These wells are typically used by the USGS to collect data on surface and/or groundwater; however, descriptions on the types of wells were not provided in the EDR report. The remaining 505 wells are mostly monitoring wells installed by



the Tucson Airport Authority, the ANG, or the USEPA. Some appear to be privately owned which is consistent with information provided in the EBS which stated a few residents with domestic wells that yielded low levels of TCE had refused to stop using their wells (ANG, 2006).

### **3.2.2 Soil**

According to the United States Soil Conservation Service, there are two soil units in the immediate vicinity of the subject property: the Cave unit and the Sahuarita-Mohave complex. The most prevalent soil on the Base is the Sahuarita-Mohave complex. Both the Sahuarita and Mohave soils are deep and well-drained with water-erosion hazards. The Cave soil unit, which covers the north and south edges of the Base, is comprised of a gravelly, fine sandy loam (ANG, 2006).

No documentation was available showing that soils at Tucson ANG Base have been tested for PFCs; therefore it is unknown whether PFCs are present in the soil. However, based on historical practices, they may be present in the soils at Building 50, Building 35, IRP Site 5, Building 12, Building 10, Former and Current Concrete Ramps, Former and Current Nozzle Testing Areas, and the Unlined Drainage Ditch.

### **3.2.3 Sediment**

No documentation was available showing that sediments at Tucson ANG Base have been tested for PFCs; therefore it is unknown whether PFCs are present in sediments. Based on historical practices, PFCs could be present in sediment in locations that have received drainage from AOCs mentioned above including Outfalls W01, W06, W10, W13, and W14.

### **3.2.4 Surface Water**

The only surface water feature of note on the subject property is the Airport Wash, a tributary of the Santa Cruz River.

A high percentage of the active administrative and industrial areas of the Base are paved or roofed and exhibit high runoff coefficients. Drainage of the developed area is by overland flow to storm drain inlets and catch basins, which are collected by a network of underground pipes. All stormwater drainage systems on the Base and surface runoff from the Base and TIA

discharge into the Airport Wash, which runs along the northern and northeastern boundaries of the Base. The Airport Wash consists of a trapezoidal channel with concrete walls and an earthen bottom, and is roughly 100 feet wide by 10 feet deep. The Airport Wash is a major tributary to the Santa Cruz River, which flows northward along the western side of the city. The two converge approximately 2.5 miles west of the Base.

The Stormwater Pollution Prevention Plan (ANG, 2012) identifies 14 drainage basins associated with the industrial areas of the Base. Appendix C-3 contains a figure and table depicting the stormwater drainage areas and associated outfalls.

No documentation was available showing that surface water at the Tucson ANG Base has been tested for PFCs; therefore it is unknown whether PFCs are present in surface water. Based on historical practices, PFCs could be present in locations that have received drainage from AOCs mentioned above including Outfalls W01, W06, W10, W13, and W14.

Due primarily to its location in a dry subtropical (desert subtype) climate, the Base does not support established wetlands or ecosystems likely to support establishment of wetlands. According to the EDR report, there are no designated wetlands on the Base as shown in Appendix C-4. Appendix C-4 also shows the TCE-contaminated area which is listed on the United States National Priority List (NPL) and the Arizona NPL.

#### **4.0 FINDINGS AND CONCLUSIONS**

Sixteen potential areas of concern have been identified at the Base during this PA as summarized in Table 1 below. Of these sixteen sites, fifteen are recommended for further investigation.

Further investigation is recommended to monitor and characterize possible soil, groundwater, surface water, and sediment PFC contamination. In AOCs where underground piping and OWSs are present, the structural integrity of the underground piping and oil/water separator should be verified.

Table 1 summarizes the recommendations and rationale for each potential AOC identified at the Base.

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**Table 1: Preliminary Assessment Report Summary and Recommendations**

No.	Potential AFFF PFC AOC	GPS Coordinates		Rationale	Recommendation
		Latitude	Longitude		
1	IRP Site 1 – Old FTA	32.131040°	-110.946305°	Former FTA used from the 1950s through 1965, when it is presumed that AFFF was not yet on Base.	NFA.
2	Building 50 – Fire Station	32.131370°	-110.950685°	Unused AFFF stored at this location, as well as AFFF in fire trucks. AFFF is filled from containers into fire trucks at this building.	Proceed to SI. Focus on soil and groundwater.
3	Building 35 – Fuel Cell Maintenance and Corrosion Control	32.130442°	-110.951820°	Previously contained an AFFF FSS.	Proceed to SI. Focus on soil and groundwater.
4	IRP Site 5 – Old Washrack Area	32.132257°	-110.948375°	Former washrack for Base vehicles including fire trucks until 1985.	Proceed to SI. Focus on soil and groundwater.
5	Building 12 – Maintenance Hangar	32.129665°	-110.948959°	Only hangar on Base with active AFFF FSS. One known release of AFFF.	Proceed to SI. Focus on soil and groundwater.
6	Building 10 – Maintenance Hangar	32.130438°	-110.948075°	Hangar with former AFFF FSS until 2004/2005.	Proceed to SI. Focus on soil and groundwater.
7	Former Concrete Ramp	32.131003°	-110.949106°	Base personnel recall portions of the ramp being “foamed” with AFFF during fuel spills and one airplane crash circa 1997.	Proceed to SI. Focus on soil and groundwater at the downgradient edges of the former ramp.
8	Current Concrete Ramp	32.128114°	-110.949105°	Adjacent to Buildings 10 and 12 which had/have AFFF FSS. Any discharges from these buildings would have entered the ramp and flowed into storm drains.	Proceed to SI. Focus on soil and groundwater at the downgradient edges of the ramp.
9	Former Nozzle Testing Area	32.130912°	-110.951437°	Nozzle testing on a dirt area with AFFF.	Proceed to SI. Focus on soil and groundwater.
10	Current Nozzle Testing Area (off-Base)	32.130968°	-110.953523°	Quarterly nozzle testing in this area with AFFF until 2015.	Proceed to SI. Focus on soil and groundwater.

**Table 1: Preliminary Assessment Report Summary and Recommendations**

No.	Potential AFFF PFC AOC	GPS Coordinates		Rationale	Recommendation
		Latitude	Longitude		
11	Unlined Drainage Ditch	32.133128°	-110.953522°	Receives and conveys stormwater from the western portion of the Base, including the Current Concrete Ramp, the Former Nozzle Testing Area, and Building 35 – Fuel Cell Maintenance and Corrosion Control.	Proceed to SI. Focus on groundwater, sediments and surface water (if present).
12	Outfall W01	32.133487°	-110.953543°	Receives drainage from the Current Concrete Ramp and the Current Nozzle Testing Area where there has been known AFFF use.	Proceed to SI. Focus on sediments and surface water (if present).
13	Outfall W06	32.133732°	-110.950832°	Receives drainage from Building 50 – Fire Station where AFFF is stored.	Proceed to SI. Focus on sediments and surface water (if present).
14	Outfall W10	32.133630°	-110.949284°	Receives drainage from Buildings 10 and 12 (known AFFF use and release), as well as potential releases from Building 9.	Proceed to SI. Focus on sediments and surface water (if present).
15	Outfall W13	32.131754°	-110.945609°	Received drainage from Former Concrete Ramp where there was known AFFF use.	Proceed to SI. Focus on sediments and surface water (if present).
16	Outfall W14	32.131439°	-110.945323°	Received drainage from Former Concrete Ramp where there was known AFFF use.	Proceed to SI. Focus on sediments and surface water (if present).

AFFF – Aqueous Film Forming Foam  
 AOC – Area of Concern  
 FD – Fire Department  
 FSS – fire suppression system  
 FTA – Fire Training Area  
 GPS – Global Positioning System  
 IRP – Environmental Restoration Program  
 NFA – no further action  
 PFC – Perfluorinated Compound  
 SI – Site Investigation

## 5.0 REFERENCES

- ANG, 2006. Final Environmental Baseline Survey, 162<sup>D</sup> Fighter Wing, Arizona Air National Guard. August.
- ANG, 2012. Draft Storm Water Pollution Prevention Plan. February.
- BB&E, 2015. Final Perfluorinated Compound (PFC) Preliminary Assessment Work Plan, Prepared for Headquarters Air National Guard Andrews AFB, Maryland. July.
- EDR, 2015. EDR Radius Map<sup>TM</sup> Report with Geotrace®. October.
- Environmental Resources Management (ERM), 2007. Final Groundwater Monitoring and Remedial Progress Report for January through March 2007. July.
- Groundwater Technology, Inc. (GTI), 1987. Site Assessment of a Former Fire Training Area at the Arizona Air National Guard. October.
- Hazardous Materials Technical Center (HMTTC), 1987. Installation Restoration Program, Preliminary Assessment – Records Search. October.
- Metcalf & Eddy, Inc., 1994. Installation Restoration Program, Community Relations Plan. May.
- USEPA, 2014. Peer Review of Health Effects Documents for PFOA and PFOS. February.

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## FIGURES

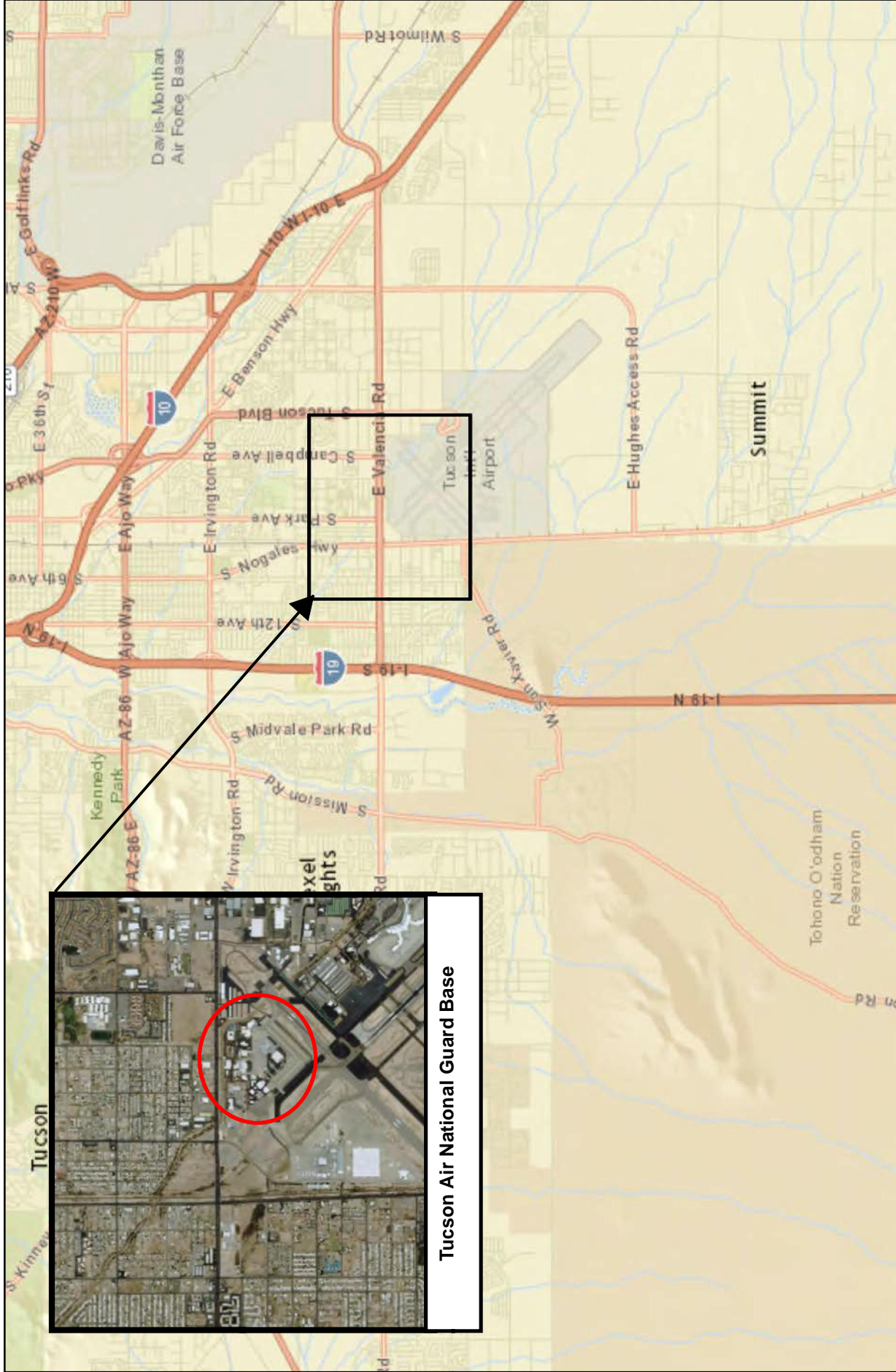
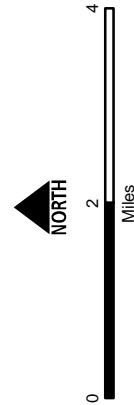
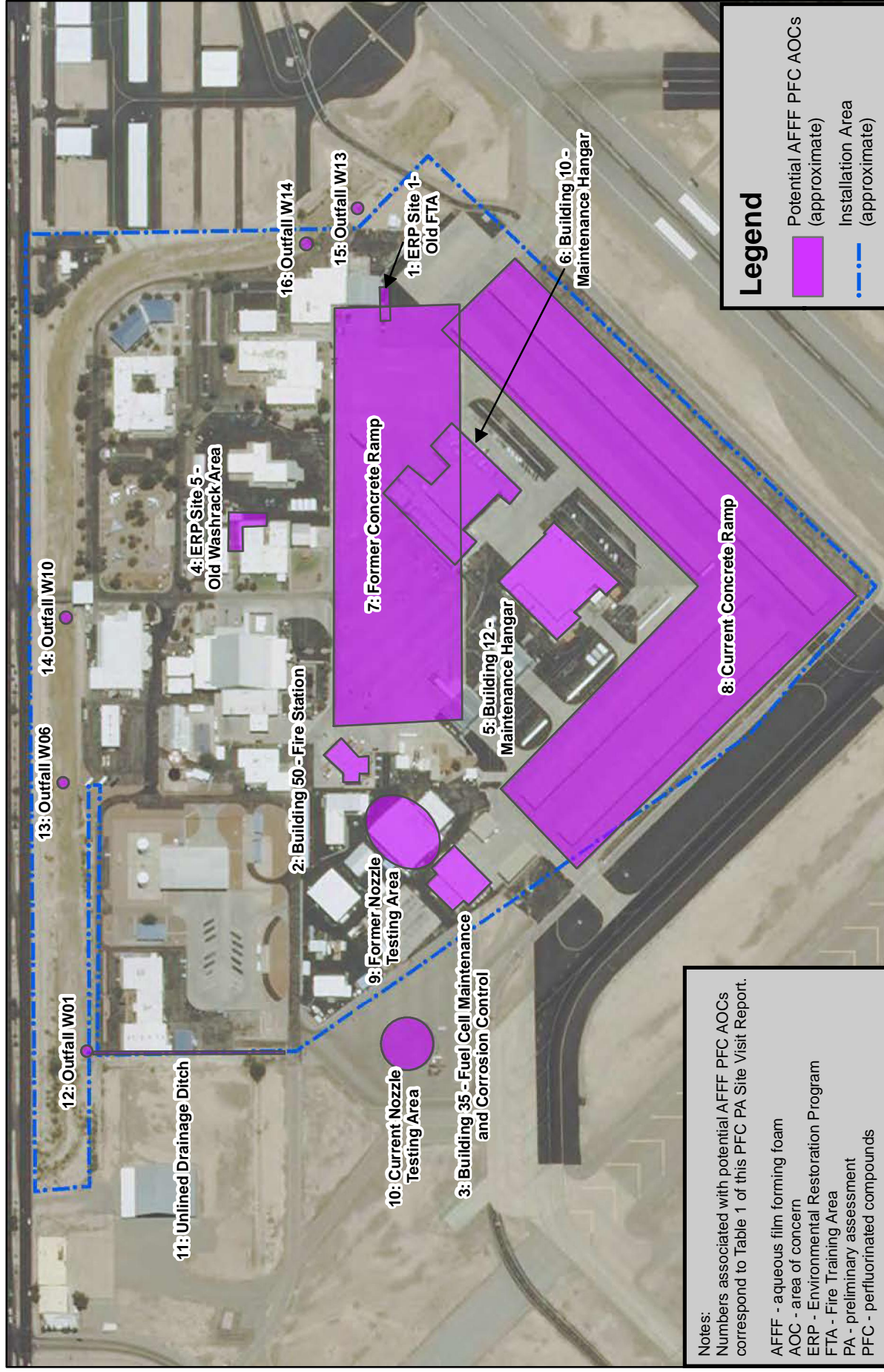


Figure 1  
Site Location Map

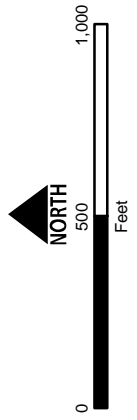
Tucson Air National Guard Base  
Tucson, Arizona







**Figure 2**  
**Site Features Map and Potential AOCs**  
**Tucson Air National Guard Base**  
**Tucson, Arizona**



## **APPENDIX A**

### **PHOTO DOCUMENTATION**

**Appendix A**  
**Tucson ANG Base, PFC PA Site Visit, Tucson, AZ – January 20, 2016**



Photo 1: Outfall W01



Photo 2: Outfall W01



**Appendix A**  
**Tucson ANG Base, PFC PA Site Visit, Tucson, AZ – January 20, 2016**



Photo 3: Storm drains near Current Nozzle Testing Area – leads to Outfall W01.



Photo 4: Current HEF FSS in Building 35 – Fuel Cell Maintenance and Corrosion Control.

**Appendix A**  
**Tucson ANG Base, PFC PA Site Visit, Tucson, AZ – January 20, 2016**



Photo 5: Hangar doors on Building 35. Drainage out to ramp area.

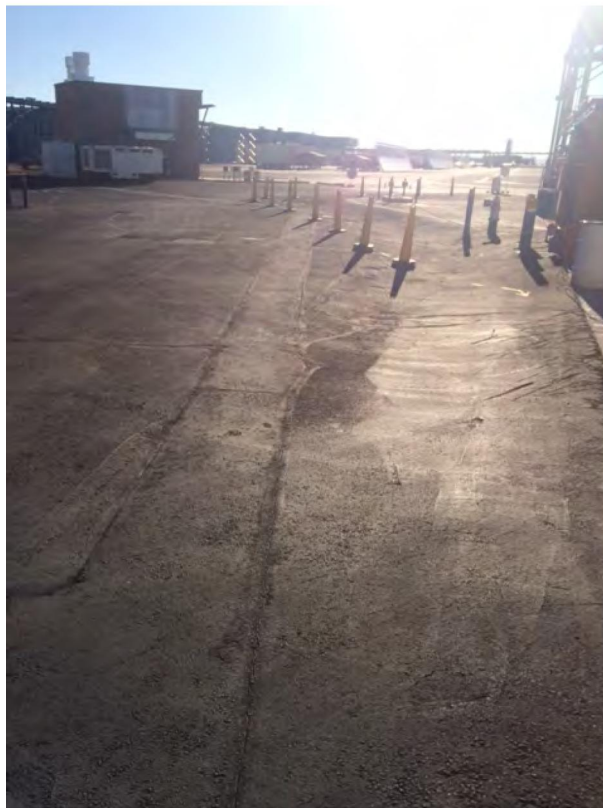


Photo 6: Storm drain near Building 35. Drains lead to Outfall W06.

**Appendix A**  
**Tucson ANG Base, PFC PA Site Visit, Tucson, AZ – January 20, 2016**



Photo 7: Outfall W14 – drainage discharge area for former ramp.



Photo 8: Outfall W13 – drainage area for former ramp.



**Appendix A**  
**Tucson ANG Base, PFC PA Site Visit, Tucson, AZ – January 20, 2016**



Photo 9: Outfall W10 which drains Hangars 10 and 12.



Photo 10: AFFF storage tank in Fire Station.

**Appendix A**  
**Tucson ANG Base, PFC PA Site Visit, Tucson, AZ – January 20, 2016**



Photo 11: RIV vehicle (1 of 2) with AFFF at Fire Station.



Photo 12: Response truck storing AFFF at Fire Station.

**Appendix A**  
**Tucson ANG Base, PFC PA Site Visit, Tucson, AZ – January 20, 2016**



Photo 13: Floor drains in Fire Station.



Photo 14: AFFF storage tank in Hangar 12.

**Appendix A**  
**Tucson ANG Base, PFC PA Site Visit, Tucson, AZ – January 20, 2016**



Photo 15: AFFF storage tank in Hangar 12.



Photo 16: AFFF storage tank in Hangar 12.



**Appendix A**  
**Tucson ANG Base, PFC PA Site Visit, Tucson, AZ – January 20, 2016**



Photo 17: AFFF system in Hangar 12.



Photo 18: AFFF System in Hangar 12.

**Appendix A**  
**Tucson ANG Base, PFC PA Site Visit, Tucson, AZ – January 20, 2016**



Photo 19: Drainage area outside Hangar 12. Drains lead to Outfall W10.



Photo 20: Converted HEF FSS in Hangar 10.

## **APPENDIX B**

### **INTERVIEW QUESTIONS AND RECORDS OF COMMUNICATION**

LTC Mike Kuntz  
EM  
1983 on site  
1995 - full time

Senior  
Capt.

James Valdez

(520)295-6161

PR451@AOL.com

Since  
1976

Interview Questions regarding AFFF use  
(At Present and back to 1970)

1. When did AFFF first start being used on this installation?

AFFF - Early 1980s.

2. What are the years of active use for each Fire Training Area (FTA), Aircraft Hangar, Fire Department, other places AFFF may have been used (collectively Potential Areas of Concern (PAOC))?

FTA - Just @ Aircraft Area - 2 Areas - Bulk off-property.

Building 9 - historical hangar - no release.

Building 10/12 - both hangars

Buildings 30 - Building 35

3. What type of AFFF is used or has been used on this installation (i.e. 3%, 6%, High Expansion Foam)?

3% initially, transitioned to 6%.

4. What manufacturer's AFFF products are used or were used on this installation (i.e. 3M, Ansul, Chemguard, etc.)?

5. Did you ever dispose of old bulk AFFF, if so, when and where?

No was not used it.

6. Is the AFFF stored as a mixed solution (3% or 6%) or do you formulate the AFFF on the installation?

Stored @ 3%, 6%.

7. If AFFF is formulated on base, where is the solution mixed, contained, transferred, etc.?

N/A

8. Are your automated fire suppression systems currently charged with AFFF or have they been retrofitted for use of high expansion foam?

- Just Building 12 now

- Historical 10, 35 - converted to HEP

- Check Building 12 -

- No AFFF @ Perimeter



- OLD FIRE HOUSE → WHEELS ARE WHITE STAINING IS NOW
- 1500 GALLON HEAD GROUND MOUNT TANK
- TRANSPORT TO TANKS W/ TRUCKS

9. If retrofitted, when was that done?

Building 10 - Around 2004-2005

Building 35 - 2014

10. Do you have an inventory of the amount of AFFF stored on the installation, now and in the past, or present in automated fire suppression systems? Were retention ponds built to store discharged AFFF? Was the AFFF trickled to the sanitary sewer or left in the pond to infiltrate?

- 750 GALLON @ IN FARM TANK
- Historically 6 GALLON PALS IN TANK OUTSIDE FIRE HOUSE + 250 GALLON HAND GROUND TANK

11. Provide a list of vehicles that carried AFFF, now and in the past, and where are/were they located? Any vehicles have a history of leaking AFFF?

1980s	P-4 (4) - 180 GALLON EACH	1980s	* P-19H (1) 210 GALL	* P-22 - 500 GALL
↓	P-19 (3) - 130 GALL		* 2 RIVS (2) 56 GALL	80s 1st
1990s		1980s	P-23 (1) 500 GALL	P-12 - 500 GALL 80s
				P-3 - 500 GALL 80s
				M1000 TANK 100 G

12. How much AFFF (gallons) is/was carried/stored in the specified vehicles?

505

13. Do you ever dispose of unused AFFF? If so, how and where?

No - NOT USED FOR TESTING, ETC.

14. Has unused AFFF ever been disposed of in the past? If so, how and where?

No

15. Do you/did you test the vehicles spray patterns to make sure equipment is working properly?

Yes. Sprayer Pattern Test monthly on Aircraft Pallets.

~~GOES~~ GOES TO STORM DRAIN - OUTSIDE WOI

16. How often are/were these spray tests performed and can you provide the locations of these tests, now and in the past?

Quarterly. New test station.  
UP WOI  
LAST  
YEAR.

ALL CRASH TESTING

Current Station, <sup>1991</sup> ~~2000~~ - Present  
"The Main Pipe" Station, ~~1991~~ 1977

36

17. Can you describe the procedure on how vehicles and systems are/were supplied with AFFF?

Gravity feed from tanks or fill up out of tank (750 gal)

18. Can you provide the procedures on how these vehicles are/were cleaned/decontaminated and where vehicle cleaning is performed currently as well as performed in the past?

In station, now.  
Former station @ wash area (under wash fire truck)

19. Is/was there a specified area on the installation where vehicles are filled with AFFF and does this area have secondary containment in case of spills?

Fire house, some containment - fire house drains to DWS & sanitizing.

20. When a release of AFFF occurs during a fire training exercise, now and in the past, how is the AFFF cleaned and disposed of?

Washed down off ramp to storm drain

21. How many FTAs are/were on this installation and where are they?

None on this installation

22. How many FTAs are active and inactive?

0 - Do maintain @ Davis Mountain

23. What types of fuels/flammables were used at the FTAs?

24. For inactive FTAs, when was the last time that fire training using AFFF was conducted at them? Find out ahead of time in Admin Record for former FTAs.

Initiated under IAP, Off - Present  
Phase I Remote Activities Report, TIA Fire  
Training Facility, Cheyenne Univ, 1992 (April)

25. What are/were the non-FTA locations where PFCs or AFFF release systems are installed (i.e. Hangars, Wastewater Treatment Plants, Fire Stations, etc.)? Where are/were these locations (Building numbers)?

Building 10, 12, 35, 9

26. Do you have a list (Building names and numbers, current and demolished) where the fire suppression systems either currently contain or have contained AFFF?

Yes

27. Do you have records of fuel spill logs and emergency response logs? Knowledge of aircraft mishaps/crashes?

- CIVILIAN AIRCRAFT - CRASHED ON SE CORNER OF RAMP - 11/96/7
- FOAMER SPILL ON OLD RAMP (SEE DRAWING) NUMEROUS TIMES

28. Do you have recollection or records of AFFF being used as a precaution in response to fuel releases to prevent fires?

SEE DRAWING - ~~FOAM~~ SPILLS ON OLD RAMP

29. Do you have recollection or records of historical emergency response sites (i.e. crash sites and fires) where AFFF was used?

No NOT LOG BOOKS - ~~SPILLS ON~~

30. Do you have recollection or record of emergency runway landings where foam might have been used as a precaution?

No

31. If not written records or incomplete written records, do you have anecdotal/verbal information and locations of spills or other emergency response incidents where AFFF was used?

N/A



32. What is the typical procedure for removing dispensed AFFF from an area where it has been used?

Spray down

33. Can you provide any other locations where AFFF has been stored, released, or used (i.e. hangars, buildings, fire stations, firefighting equipment testing and maintenance areas, emergency response sites, storm water/surface water, waste water treatment plants, and AFFF ponds)?

- TOSTER @ INITIAL CONTAMINATION
- BUILDING 12 HAD ACCIDENTAL POWERS - SPARK PLUGS
- POWER WIRE IN THE WAREHOUSE

34. Do you have or did you have a chrome plating shop on base? If no, skip to Question #38.

NO

35. What were/are the years of operation of that chrome plating shop?

36. Do you know whether the shop has/had a foam blanket mist suppression system or used a fume hood for emissions control?

37. If foam blanket mist suppression was used, where was the foam stored, mixed, applied, etc.?

38. Is there anyone else or other base organization personnel that you would recommend we interview? Name, organization, position, phone number, e-mail.

39. Was it common practice to wash away fuel spills with AFFF?

YES. 1st time only, not now

40. Identify drainage patterns around flightline/ramp area. Point source discharge is likely AFFF Area of Concern (AOC).

Sos Datura M.H.

OLD RAMP - OUTFALLS W/3, W/4, W/10

Bulbine 12 flowers - W10

Then there was - was

"Historie" - Ohne DNR (Seite 4?)

- Prosimy wo6

Domino 9 - 11<sup>te</sup> pessoas - 1010

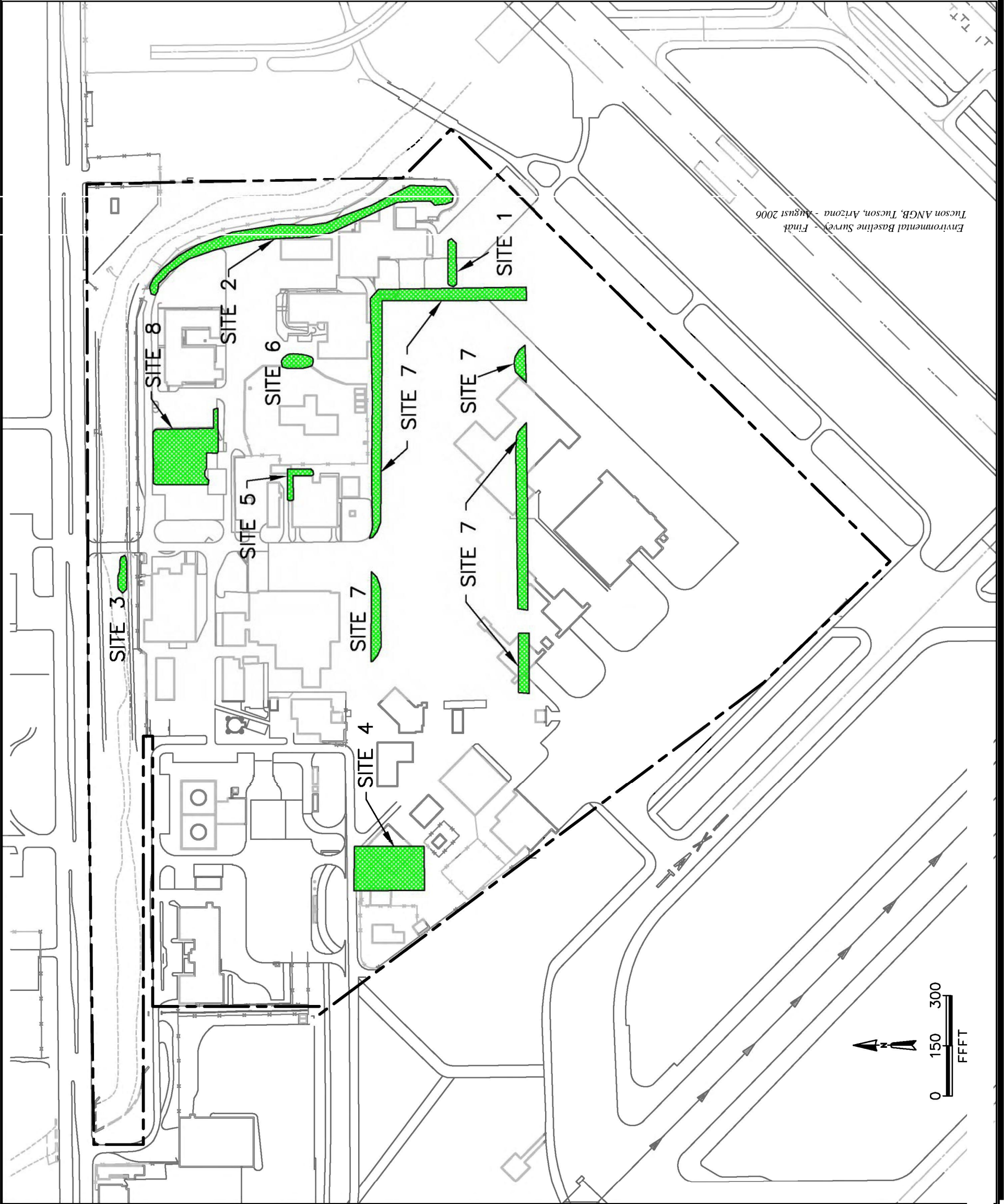
## **APPENDIX C**

### **SUPPORTING DOCUMENTATION**

## **APPENDIX C-1**

### **MAP OF IRP SITES**





Tucson AANG, Tucson, Arizona - August 2006  
Environmental Baseline Survey - Final

Figure 3-9  
IRP Sites Location Map  
Environmental Baseline Survey  
162nd Fighter Wing  
Arizona Air National Guard  
Tucson, Arizona

## **APPENDIX C-2**

### **EDR ONE-MILE RADIUS WATER WELLS INFORMATION**

## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

### LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

### WELL SEARCH DISTANCE INFORMATION

<u>DATABASE</u>	<u>SEARCH DISTANCE (miles)</u>
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.250

### FEDERAL USGS WELL INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
D18	USGS40000036501	1/8 - 1/4 Mile NW
S137	USGS40000030724	1/2 - 1 Mile WNW
T146	USGS40000036500	1/2 - 1 Mile East
X160	USGS40000036436	1/2 - 1 Mile SW
V161	USGS40000036503	1/2 - 1 Mile West
AA183	USGS40000036429	1/2 - 1 Mile SW
Z185	USGS40000036425	1/2 - 1 Mile SE
195	USGS40000036559	1/2 - 1 Mile NE
AE196	USGS40000036568	1/2 - 1 Mile NW
AE203	USGS40000036575	1/2 - 1 Mile NNW
AH211	USGS40000036556	1/2 - 1 Mile NW
AI213	USGS40000036430	1/2 - 1 Mile SW
AE237	USGS40000036580	1/2 - 1 Mile NNW
AL248	USGS40000036588	1/2 - 1 Mile NNE
249	USGS40000036576	1/2 - 1 Mile NE
AP285	USGS40000036509	1/2 - 1 Mile West
AR292	USGS40000030721	1/2 - 1 Mile West
AS294	USGS40000036421	1/2 - 1 Mile SW
AW324	USGS40000036490	1/2 - 1 Mile East
BD344	USGS40000036414	1/2 - 1 Mile SW
BE346	USGS40000036548	1/2 - 1 Mile WNW
AW347	USGS40000036484	1/2 - 1 Mile East
BE362	USGS40000036550	1/2 - 1 Mile WNW
BE383	USGS40000036554	1/2 - 1 Mile WNW
BB384	USGS40000036512	1/2 - 1 Mile East
391	USGS40000036557	1/2 - 1 Mile WNW

### FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
D32	AZ0420418	1/8 - 1/4 Mile NW

Note: PWS System location is not always the same as well location.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

## STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A1	AZ7000000028268	0 - 1/8 Mile ESE
A2	AZ7000000028269	0 - 1/8 Mile ESE
A3	AZ7000000028270	0 - 1/8 Mile ESE
B4	AZ7000000028256	0 - 1/8 Mile West
B5	AZ7000000028257	0 - 1/8 Mile West
B6	AZ7000000028254	0 - 1/8 Mile West
B7	AZ7000000028255	0 - 1/8 Mile West
B8	AZ7000000028258	0 - 1/8 Mile West
B9	AZ7000000028261	0 - 1/8 Mile West
B10	AZ7000000028262	0 - 1/8 Mile West
B11	AZ7000000028259	0 - 1/8 Mile West
B12	AZ7000000028260	0 - 1/8 Mile West
C13	AZ7000000028413	0 - 1/8 Mile NNE
C14	AZ7000000028412	0 - 1/8 Mile NNE
C15	AZ7000000028415	0 - 1/8 Mile NNE
C16	AZ7000000028414	0 - 1/8 Mile NNE
17	AZ7000000028208	0 - 1/8 Mile SE
19	AZ7000000028167	1/8 - 1/4 Mile SSE
D20	AZ7000000028419	1/8 - 1/4 Mile NW
D21	AZ7000000028420	1/8 - 1/4 Mile NW
D22	AZ7000000028418	1/8 - 1/4 Mile NW
D23	AZ7000000028416	1/8 - 1/4 Mile NW
D24	AZ7000000028417	1/8 - 1/4 Mile NW
D25	AZ7000000028421	1/8 - 1/4 Mile NW
D26	AZ7000000028425	1/8 - 1/4 Mile NW
D27	AZ7000000028426	1/8 - 1/4 Mile NW
D28	AZ7000000028424	1/8 - 1/4 Mile NW
D29	AZ7000000028422	1/8 - 1/4 Mile NW
D30	AZ7000000028423	1/8 - 1/4 Mile NW
31	AZ7000000028166	1/8 - 1/4 Mile SSW
E34	AZ7000000028400	1/8 - 1/4 Mile NE
E35	AZ7000000028399	1/8 - 1/4 Mile NE
E36	AZ7000000028402	1/8 - 1/4 Mile NE
E37	AZ7000000028401	1/8 - 1/4 Mile NE
E38	AZ7000000028396	1/8 - 1/4 Mile NE
E39	AZ7000000028395	1/8 - 1/4 Mile NE
E40	AZ7000000028398	1/8 - 1/4 Mile NE
E41	AZ7000000028397	1/8 - 1/4 Mile NE
E42	AZ7000000028403	1/8 - 1/4 Mile NE
E43	AZ7000000028409	1/8 - 1/4 Mile NE
E44	AZ7000000028408	1/8 - 1/4 Mile NE
E45	AZ7000000028411	1/8 - 1/4 Mile NE
E46	AZ7000000028410	1/8 - 1/4 Mile NE
E47	AZ7000000028405	1/8 - 1/4 Mile NE
E48	AZ7000000028404	1/8 - 1/4 Mile NE
E49	AZ7000000028407	1/8 - 1/4 Mile NE
E50	AZ7000000028406	1/8 - 1/4 Mile NE
F51	AZ7000000028173	1/8 - 1/4 Mile SE
F52	AZ7000000028174	1/8 - 1/4 Mile SE
F53	AZ7000000028171	1/8 - 1/4 Mile SE
F54	AZ7000000028172	1/8 - 1/4 Mile SE
F55	AZ7000000028177	1/8 - 1/4 Mile SE

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

## STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
F56	AZ7000000028178	1/8 - 1/4 Mile SE
F57	AZ7000000028175	1/8 - 1/4 Mile SE
F58	AZ7000000028176	1/8 - 1/4 Mile SE
G59	AZ7000000028264	1/8 - 1/4 Mile West
G60	AZ7000000028263	1/8 - 1/4 Mile West
G61	AZ7000000028265	1/8 - 1/4 Mile West
G62	AZ7000000028267	1/8 - 1/4 Mile West
G63	AZ7000000028266	1/8 - 1/4 Mile West
H64	AZ7000000028429	1/8 - 1/4 Mile WNW
H65	AZ7000000028428	1/8 - 1/4 Mile WNW
H66	AZ7000000028427	1/8 - 1/4 Mile WNW
H67	AZ7000000028432	1/8 - 1/4 Mile WNW
H68	AZ7000000028431	1/8 - 1/4 Mile WNW
H69	AZ7000000028430	1/8 - 1/4 Mile WNW
I70	AZ7000000028154	1/4 - 1/2 Mile WSW
I71	AZ7000000028153	1/4 - 1/2 Mile WSW
I72	AZ7000000028156	1/4 - 1/2 Mile WSW
I73	AZ7000000028155	1/4 - 1/2 Mile WSW
I74	AZ7000000028150	1/4 - 1/2 Mile WSW
I75	AZ7000000028149	1/4 - 1/2 Mile WSW
I76	AZ7000000028152	1/4 - 1/2 Mile WSW
I77	AZ7000000028151	1/4 - 1/2 Mile WSW
I78	AZ7000000028157	1/4 - 1/2 Mile WSW
I79	AZ7000000028163	1/4 - 1/2 Mile WSW
I80	AZ7000000028162	1/4 - 1/2 Mile WSW
I81	AZ7000000028165	1/4 - 1/2 Mile WSW
I82	AZ7000000028164	1/4 - 1/2 Mile WSW
I83	AZ7000000028159	1/4 - 1/2 Mile WSW
I84	AZ7000000028158	1/4 - 1/2 Mile WSW
I85	AZ7000000028161	1/4 - 1/2 Mile WSW
I86	AZ7000000028160	1/4 - 1/2 Mile WSW
I87	AZ7000000028148	1/4 - 1/2 Mile WSW
I88	AZ7000000028144	1/4 - 1/2 Mile WSW
I89	AZ7000000028143	1/4 - 1/2 Mile WSW
I90	AZ7000000028142	1/4 - 1/2 Mile WSW
I91	AZ7000000028147	1/4 - 1/2 Mile WSW
I92	AZ7000000028146	1/4 - 1/2 Mile WSW
I93	AZ7000000028145	1/4 - 1/2 Mile WSW
J94	AZ7000000028529	1/4 - 1/2 Mile NNW
J95	AZ7000000028530	1/4 - 1/2 Mile NNW
K96	AZ7000000028031	1/4 - 1/2 Mile South
K97	AZ7000000028030	1/4 - 1/2 Mile South
K98	AZ7000000028029	1/4 - 1/2 Mile South
K99	AZ7000000028034	1/4 - 1/2 Mile South
K100	AZ7000000028033	1/4 - 1/2 Mile South
K101	AZ7000000028032	1/4 - 1/2 Mile South
L102	AZ7000000028273	1/4 - 1/2 Mile East
L103	AZ7000000028272	1/4 - 1/2 Mile East
L104	AZ7000000028275	1/4 - 1/2 Mile East
L105	AZ7000000028274	1/4 - 1/2 Mile East
M106	AZ7000000028392	1/4 - 1/2 Mile ENE
M107	AZ7000000028391	1/4 - 1/2 Mile ENE

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

## STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
M108	AZ7000000028394	1/4 - 1/2 Mile ENE
M109	AZ7000000028393	1/4 - 1/2 Mile ENE
N110	AZ7000000028387	1/4 - 1/2 Mile WNW
N111	AZ7000000028386	1/4 - 1/2 Mile WNW
N112	AZ7000000028385	1/4 - 1/2 Mile WNW
N113	AZ7000000028390	1/4 - 1/2 Mile WNW
N114	AZ7000000028389	1/4 - 1/2 Mile WNW
N115	AZ7000000028388	1/4 - 1/2 Mile WNW
O116	AZ7000000027960	1/4 - 1/2 Mile SSW
O117	AZ7000000027959	1/4 - 1/2 Mile SSW
O118	AZ7000000027962	1/4 - 1/2 Mile SSW
O119	AZ7000000027961	1/4 - 1/2 Mile SSW
120	AZ7000000028575	1/4 - 1/2 Mile North
P121	AZ7000000028576	1/4 - 1/2 Mile NNW
P122	AZ7000000028577	1/4 - 1/2 Mile NNW
123	AZ7000000028574	1/4 - 1/2 Mile NNE
124	AZ7000000028578	1/4 - 1/2 Mile NNW
125	AZ7000000028438	1/4 - 1/2 Mile ENE
126	AZ7000000028190	1/4 - 1/2 Mile ESE
127	AZ7000000028382	1/4 - 1/2 Mile WNW
Q128	AZ7000000027933	1/4 - 1/2 Mile SE
Q129	AZ7000000027934	1/4 - 1/2 Mile SE
R130	AZ7000000028062	1/4 - 1/2 Mile ESE
R131	AZ7000000028061	1/4 - 1/2 Mile ESE
R132	AZ7000000028063	1/4 - 1/2 Mile ESE
R133	AZ7000000028065	1/4 - 1/2 Mile ESE
R134	AZ7000000028064	1/4 - 1/2 Mile ESE
135	AZ7000000028615	1/4 - 1/2 Mile North
136	AZ7000000028579	1/4 - 1/2 Mile NW
138	AZ7000000027855	1/2 - 1 Mile South
S139	AZ7000000028526	1/2 - 1 Mile WNW
S140	AZ7000000028527	1/2 - 1 Mile WNW
S141	AZ7000000028528	1/2 - 1 Mile WNW
142	AZ7000000028022	1/2 - 1 Mile WSW
143	AZ7000000028271	1/2 - 1 Mile East
T144	AZ7000000028437	1/2 - 1 Mile ENE
145	AZ7000000028580	1/2 - 1 Mile NE
147	AZ7000000028189	1/2 - 1 Mile ESE
148	AZ7000000027932	1/2 - 1 Mile SE
U149	AZ7000000028616	1/2 - 1 Mile NW
U150	AZ7000000028617	1/2 - 1 Mile NW
U151	AZ7000000028618	1/2 - 1 Mile NW
V152	AZ7000000028383	1/2 - 1 Mile West
W153	AZ7000000028058	1/2 - 1 Mile ESE
W154	AZ7000000028057	1/2 - 1 Mile ESE
W155	AZ7000000028060	1/2 - 1 Mile ESE
W156	AZ7000000028059	1/2 - 1 Mile ESE
X157	AZ7000000027910	1/2 - 1 Mile SW
X158	AZ7000000027911	1/2 - 1 Mile SW
159	AZ7000000028656	1/2 - 1 Mile North
Y162	AZ7000000028007	1/2 - 1 Mile WSW
Y163	AZ7000000028006	1/2 - 1 Mile WSW

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

## STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
Y164	AZ7000000028008	1/2 - 1 Mile WSW
Y165	AZ7000000028010	1/2 - 1 Mile WSW
Y166	AZ7000000028009	1/2 - 1 Mile WSW
Y167	AZ7000000028002	1/2 - 1 Mile WSW
Y168	AZ7000000028001	1/2 - 1 Mile WSW
Y169	AZ7000000028003	1/2 - 1 Mile WSW
Y170	AZ7000000028005	1/2 - 1 Mile WSW
Y171	AZ7000000028004	1/2 - 1 Mile WSW
Y172	AZ7000000028017	1/2 - 1 Mile WSW
Y173	AZ7000000028016	1/2 - 1 Mile WSW
Y174	AZ7000000028018	1/2 - 1 Mile WSW
Y175	AZ7000000028020	1/2 - 1 Mile WSW
Y176	AZ7000000028019	1/2 - 1 Mile WSW
Y177	AZ7000000028012	1/2 - 1 Mile WSW
Y178	AZ7000000028011	1/2 - 1 Mile WSW
Y179	AZ7000000028013	1/2 - 1 Mile WSW
Y180	AZ7000000028015	1/2 - 1 Mile WSW
Y181	AZ7000000028014	1/2 - 1 Mile WSW
Z182	AZ7000000027881	1/2 - 1 Mile SE
184	AZ7000000027861	1/2 - 1 Mile SE
AB186	AZ7000000028281	1/2 - 1 Mile East
AB187	AZ7000000028282	1/2 - 1 Mile East
AB188	AZ7000000028283	1/2 - 1 Mile East
AC189	AZ7000000028434	1/2 - 1 Mile East
AC190	AZ7000000028433	1/2 - 1 Mile East
AC191	AZ7000000028436	1/2 - 1 Mile East
AC192	AZ7000000028435	1/2 - 1 Mile East
AD193	AZ7000000028187	1/2 - 1 Mile ESE
AD194	AZ7000000028188	1/2 - 1 Mile ESE
197	AZ7000000028573	1/2 - 1 Mile WNW
AA198	AZ7000000027849	1/2 - 1 Mile SW
AA199	AZ7000000027850	1/2 - 1 Mile SW
AF200	AZ7000000028682	1/2 - 1 Mile NNW
AF201	AZ7000000028683	1/2 - 1 Mile NNW
AF202	AZ7000000028684	1/2 - 1 Mile NNW
204	AZ7000000027813	1/2 - 1 Mile SW
AG205	AZ7000000027906	1/2 - 1 Mile WSW
AG206	AZ7000000027905	1/2 - 1 Mile WSW
AG207	AZ7000000027904	1/2 - 1 Mile WSW
AG208	AZ7000000027909	1/2 - 1 Mile WSW
AG209	AZ7000000027908	1/2 - 1 Mile WSW
AG210	AZ7000000027907	1/2 - 1 Mile WSW
AJ214	AZ7000000028044	1/2 - 1 Mile ESE
AJ215	AZ7000000028043	1/2 - 1 Mile ESE
AJ216	AZ7000000028046	1/2 - 1 Mile ESE
AJ217	AZ7000000028045	1/2 - 1 Mile ESE
AJ218	AZ7000000028042	1/2 - 1 Mile ESE
AJ219	AZ7000000028039	1/2 - 1 Mile ESE
AJ220	AZ7000000028038	1/2 - 1 Mile ESE
AJ221	AZ7000000028041	1/2 - 1 Mile ESE
AJ222	AZ7000000028040	1/2 - 1 Mile ESE
AJ223	AZ7000000028047	1/2 - 1 Mile ESE



# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

## STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
AJ224	AZ7000000028054	1/2 - 1 Mile ESE
AJ225	AZ7000000028053	1/2 - 1 Mile ESE
AJ226	AZ7000000028056	1/2 - 1 Mile ESE
AJ227	AZ7000000028055	1/2 - 1 Mile ESE
AJ228	AZ7000000028052	1/2 - 1 Mile ESE
AJ229	AZ7000000028049	1/2 - 1 Mile ESE
AJ230	AZ7000000028048	1/2 - 1 Mile ESE
AJ231	AZ7000000028051	1/2 - 1 Mile ESE
AJ232	AZ7000000028050	1/2 - 1 Mile ESE
233	AZ7000000027779	1/2 - 1 Mile SSW
AK234	AZ7000000028138	1/2 - 1 Mile West
AK235	AZ7000000028139	1/2 - 1 Mile West
AK236	AZ7000000028140	1/2 - 1 Mile West
AL238	AZ7000000028709	1/2 - 1 Mile NNE
AL239	AZ7000000028710	1/2 - 1 Mile NNE
AM240	AZ7000000027997	1/2 - 1 Mile WSW
AM241	AZ7000000027996	1/2 - 1 Mile WSW
AM242	AZ7000000027995	1/2 - 1 Mile WSW
AM243	AZ7000000028000	1/2 - 1 Mile WSW
AM244	AZ7000000027999	1/2 - 1 Mile WSW
AM245	AZ7000000027998	1/2 - 1 Mile WSW
AH246	AZ7000000028619	1/2 - 1 Mile NW
247	AZ7000000027666	1/2 - 1 Mile South
AI250	AZ7000000027841	1/2 - 1 Mile SW
AI251	AZ7000000027842	1/2 - 1 Mile SW
AI252	AZ7000000027840	1/2 - 1 Mile SW
AI253	AZ7000000027838	1/2 - 1 Mile SW
AI254	AZ7000000027839	1/2 - 1 Mile SW
AI255	AZ7000000027843	1/2 - 1 Mile SW
AI256	AZ7000000027847	1/2 - 1 Mile SW
AI257	AZ7000000027848	1/2 - 1 Mile SW
AI258	AZ7000000027846	1/2 - 1 Mile SW
AI259	AZ7000000027844	1/2 - 1 Mile SW
AI260	AZ7000000027845	1/2 - 1 Mile SW
AN261	AZ7000000027766	1/2 - 1 Mile SW
AN262	AZ7000000027765	1/2 - 1 Mile SW
AN263	AZ7000000027768	1/2 - 1 Mile SW
AN264	AZ7000000027767	1/2 - 1 Mile SW
AN265	AZ7000000027764	1/2 - 1 Mile SW
AN266	AZ7000000027761	1/2 - 1 Mile SW
AN267	AZ7000000027760	1/2 - 1 Mile SW
AN268	AZ7000000027763	1/2 - 1 Mile SW
AN269	AZ7000000027762	1/2 - 1 Mile SW
AN270	AZ7000000027769	1/2 - 1 Mile SW
AN271	AZ7000000027776	1/2 - 1 Mile SW
AN272	AZ7000000027775	1/2 - 1 Mile SW
AN273	AZ7000000027778	1/2 - 1 Mile SW
AN274	AZ7000000027777	1/2 - 1 Mile SW
AN275	AZ7000000027774	1/2 - 1 Mile SW
AN276	AZ7000000027771	1/2 - 1 Mile SW
AN277	AZ7000000027770	1/2 - 1 Mile SW
AN278	AZ7000000027773	1/2 - 1 Mile SW

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

## STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
AN279	AZ7000000027772	1/2 - 1 Mile SW
280	AZ7000000028280	1/2 - 1 Mile East
AO281	AZ7000000028184	1/2 - 1 Mile East
AO282	AZ7000000028185	1/2 - 1 Mile East
AO283	AZ7000000028186	1/2 - 1 Mile East
284	AZ7000000027903	1/2 - 1 Mile WSW
286	AZ7000000028531	1/2 - 1 Mile ENE
AQ287	AZ7000000027799	1/2 - 1 Mile SE
AQ288	AZ7000000027800	1/2 - 1 Mile SE
289	AZ7000000028037	1/2 - 1 Mile ESE
290	AZ7000000027665	1/2 - 1 Mile SSW
AR291	AZ7000000028245	1/2 - 1 Mile West
AP293	AZ7000000028378	1/2 - 1 Mile West
295	AZ7000000028614	1/2 - 1 Mile NW
296	AZ7000000028755	1/2 - 1 Mile North
AT297	AZ7000000027750	1/2 - 1 Mile SW
AT298	AZ7000000027751	1/2 - 1 Mile SW
AT299	AZ7000000027752	1/2 - 1 Mile SW
AT300	AZ7000000027747	1/2 - 1 Mile SW
AT301	AZ7000000027748	1/2 - 1 Mile SW
AT302	AZ7000000027749	1/2 - 1 Mile SW
AT303	AZ7000000027753	1/2 - 1 Mile SW
AT304	AZ7000000027757	1/2 - 1 Mile SW
AT305	AZ7000000027758	1/2 - 1 Mile SW
AT306	AZ7000000027759	1/2 - 1 Mile SW
AT307	AZ7000000027754	1/2 - 1 Mile SW
AT308	AZ7000000027755	1/2 - 1 Mile SW
AT309	AZ7000000027756	1/2 - 1 Mile SW
AU310	AZ7000000028711	1/2 - 1 Mile NNW
AU311	AZ7000000028712	1/2 - 1 Mile NNW
312	AZ7000000027994	1/2 - 1 Mile WSW
AS313	AZ7000000027835	1/2 - 1 Mile SW
AS314	AZ7000000027834	1/2 - 1 Mile SW
AS315	AZ7000000027837	1/2 - 1 Mile SW
AS316	AZ7000000027836	1/2 - 1 Mile SW
AV317	AZ7000000027924	1/2 - 1 Mile ESE
AV318	AZ7000000027923	1/2 - 1 Mile ESE
AV319	AZ7000000027922	1/2 - 1 Mile ESE
AV320	AZ7000000027925	1/2 - 1 Mile ESE
AV321	AZ7000000027928	1/2 - 1 Mile ESE
AV322	AZ7000000027927	1/2 - 1 Mile ESE
AV323	AZ7000000027926	1/2 - 1 Mile ESE
AX325	AZ7000000028756	1/2 - 1 Mile NNW
AX326	AZ7000000028757	1/2 - 1 Mile NNW
AY327	AZ7000000027662	1/2 - 1 Mile SSW
AY328	AZ7000000027663	1/2 - 1 Mile SSW
AY329	AZ7000000027664	1/2 - 1 Mile SSW
AZ330	AZ7000000028205	1/2 - 1 Mile West
AZ331	AZ7000000028206	1/2 - 1 Mile West
AZ332	AZ7000000028207	1/2 - 1 Mile West
BA333	AZ7000000027793	1/2 - 1 Mile SE
BA334	AZ7000000027792	1/2 - 1 Mile SE

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

## STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
BA335	AZ7000000027794	1/2 - 1 Mile SE
BA336	AZ7000000027796	1/2 - 1 Mile SE
BA337	AZ7000000027795	1/2 - 1 Mile SE
BB338	AZ7000000028439	1/2 - 1 Mile East
BB339	AZ7000000028440	1/2 - 1 Mile East
BC340	AZ7000000028181	1/2 - 1 Mile East
BC341	AZ7000000028182	1/2 - 1 Mile East
BC342	AZ7000000028183	1/2 - 1 Mile East
343	AZ7000000028758	1/2 - 1 Mile NNW
345	AZ7000000028713	1/2 - 1 Mile NW
348	AZ7000000027555	1/2 - 1 Mile SSW
349	AZ7000000028036	1/2 - 1 Mile ESE
BD350	AZ7000000027738	1/2 - 1 Mile SW
BD351	AZ7000000027739	1/2 - 1 Mile SW
BD352	AZ7000000027740	1/2 - 1 Mile SW
BD353	AZ7000000027735	1/2 - 1 Mile SW
BD354	AZ7000000027736	1/2 - 1 Mile SW
BD355	AZ7000000027737	1/2 - 1 Mile SW
BD356	AZ7000000027744	1/2 - 1 Mile SW
BD357	AZ7000000027745	1/2 - 1 Mile SW
BD358	AZ7000000027746	1/2 - 1 Mile SW
BD359	AZ7000000027741	1/2 - 1 Mile SW
BD360	AZ7000000027742	1/2 - 1 Mile SW
BD361	AZ7000000027743	1/2 - 1 Mile SW
BF363	AZ7000000027648	1/2 - 1 Mile SW
BF364	AZ7000000027647	1/2 - 1 Mile SW
BF365	AZ7000000027649	1/2 - 1 Mile SW
BF366	AZ7000000027651	1/2 - 1 Mile SW
BF367	AZ7000000027650	1/2 - 1 Mile SW
BF368	AZ7000000027643	1/2 - 1 Mile SW
BF369	AZ7000000027642	1/2 - 1 Mile SW
BF370	AZ7000000027644	1/2 - 1 Mile SW
BF371	AZ7000000027646	1/2 - 1 Mile SW
BF372	AZ7000000027645	1/2 - 1 Mile SW
BF373	AZ7000000027658	1/2 - 1 Mile SW
BF374	AZ7000000027657	1/2 - 1 Mile SW
BF375	AZ7000000027659	1/2 - 1 Mile SW
BF376	AZ7000000027661	1/2 - 1 Mile SW
BF377	AZ7000000027660	1/2 - 1 Mile SW
BF378	AZ7000000027653	1/2 - 1 Mile SW
BF379	AZ7000000027652	1/2 - 1 Mile SW
BF380	AZ7000000027654	1/2 - 1 Mile SW
BF381	AZ7000000027656	1/2 - 1 Mile SW
BF382	AZ7000000027655	1/2 - 1 Mile SW
385	AZ7000000028759	1/2 - 1 Mile NNW
BG386	AZ7000000027830	1/2 - 1 Mile WSW
BG387	AZ7000000027829	1/2 - 1 Mile WSW
BG388	AZ7000000027832	1/2 - 1 Mile WSW
BG389	AZ7000000027831	1/2 - 1 Mile WSW
390	AZ7000000028581	1/2 - 1 Mile ENE
392	AZ7000000028817	1/2 - 1 Mile North
BH393	AZ7000000028776	1 - 2 Miles NNW

## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

### STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
BH394	AZ7000000028777	1 - 2 Miles NNW
395	AZ7000000028818	1 - 2 Miles NNW
BI396	AZ7000000027395	1 - 2 Miles SSW
BI397	AZ7000000027396	1 - 2 Miles SSW
BJ398	AZ7000000028277	1 - 2 Miles East
BJ399	AZ7000000028278	1 - 2 Miles East
BJ400	AZ7000000028279	1 - 2 Miles East
BK401	AZ7000000028760	1 - 2 Miles NW
BK402	AZ7000000028761	1 - 2 Miles NW
BK403	AZ7000000028762	1 - 2 Miles NW
BL404	AZ7000000027638	1 - 2 Miles SW
BL405	AZ7000000027637	1 - 2 Miles SW
BL406	AZ7000000027636	1 - 2 Miles SW
BL407	AZ7000000027641	1 - 2 Miles SW
BL408	AZ7000000027640	1 - 2 Miles SW
BL409	AZ7000000027639	1 - 2 Miles SW
410	AZ7000000027685	1 - 2 Miles SW
411	AZ7000000028819	1 - 2 Miles NNW
BM412	AZ7000000028179	1 - 2 Miles East
BM413	AZ7000000028180	1 - 2 Miles East
BN414	AZ7000000027730	1 - 2 Miles SW
BN415	AZ7000000027729	1 - 2 Miles SW
BN416	AZ7000000027732	1 - 2 Miles SW
BN417	AZ7000000027731	1 - 2 Miles SW
BO418	AZ7000000027545	1 - 2 Miles SSW
BO419	AZ7000000027546	1 - 2 Miles SSW
BO420	AZ7000000027547	1 - 2 Miles SSW
BO421	AZ7000000027544	1 - 2 Miles SSW
BO422	AZ7000000027541	1 - 2 Miles SSW
BO423	AZ7000000027542	1 - 2 Miles SSW
BO424	AZ7000000027543	1 - 2 Miles SSW
BO425	AZ7000000027552	1 - 2 Miles SSW
BO426	AZ7000000027553	1 - 2 Miles SSW
BO427	AZ7000000027554	1 - 2 Miles SSW
BO428	AZ7000000027551	1 - 2 Miles SSW
BO429	AZ7000000027548	1 - 2 Miles SSW
BO430	AZ7000000027549	1 - 2 Miles SSW
BO431	AZ7000000027550	1 - 2 Miles SSW
BP432	AZ7000000028239	1 - 2 Miles West
BP433	AZ7000000028240	1 - 2 Miles West
BP434	AZ7000000028241	1 - 2 Miles West
BQ435	AZ7000000028353	1 - 2 Miles West
BQ436	AZ7000000028352	1 - 2 Miles West
BQ437	AZ7000000028351	1 - 2 Miles West
BQ438	AZ7000000028354	1 - 2 Miles West
BQ439	AZ7000000028357	1 - 2 Miles West
BQ440	AZ7000000028356	1 - 2 Miles West
BQ441	AZ7000000028355	1 - 2 Miles West
BQ442	AZ7000000028350	1 - 2 Miles West
BQ443	AZ7000000028345	1 - 2 Miles West
BQ444	AZ7000000028344	1 - 2 Miles West
BQ445	AZ7000000028343	1 - 2 Miles West

## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

### STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
BQ446	AZ7000000028346	1 - 2 Miles West
BQ447	AZ7000000028349	1 - 2 Miles West
BQ448	AZ7000000028348	1 - 2 Miles West
BQ449	AZ7000000028347	1 - 2 Miles West
BQ450	AZ7000000028358	1 - 2 Miles West
BQ451	AZ7000000028369	1 - 2 Miles West
BQ452	AZ7000000028368	1 - 2 Miles West
BQ453	AZ7000000028367	1 - 2 Miles West
BQ454	AZ7000000028370	1 - 2 Miles West
BQ455	AZ7000000028373	1 - 2 Miles West
BQ456	AZ7000000028372	1 - 2 Miles West
BQ457	AZ7000000028371	1 - 2 Miles West
BQ458	AZ7000000028366	1 - 2 Miles West
BQ459	AZ7000000028361	1 - 2 Miles West
BQ460	AZ7000000028360	1 - 2 Miles West
BQ461	AZ7000000028359	1 - 2 Miles West
BQ462	AZ7000000028362	1 - 2 Miles West
BQ463	AZ7000000028365	1 - 2 Miles West
BQ464	AZ7000000028364	1 - 2 Miles West
BQ465	AZ7000000028363	1 - 2 Miles West
BR466	AZ7000000027827	1 - 2 Miles WSW
BR467	AZ7000000027828	1 - 2 Miles WSW
BS468	AZ7000000028820	1 - 2 Miles NNW
BS469	AZ7000000028821	1 - 2 Miles NNW
BT470	AZ7000000028509	1 - 2 Miles WNW
BT471	AZ7000000028510	1 - 2 Miles WNW
BT472	AZ7000000028508	1 - 2 Miles WNW
BT473	AZ7000000028506	1 - 2 Miles WNW
BT474	AZ7000000028507	1 - 2 Miles WNW
BT475	AZ7000000028511	1 - 2 Miles WNW
BT476	AZ7000000028515	1 - 2 Miles WNW
BT477	AZ7000000028516	1 - 2 Miles WNW
BT478	AZ7000000028514	1 - 2 Miles WNW
BT479	AZ7000000028512	1 - 2 Miles WNW
BT480	AZ7000000028513	1 - 2 Miles WNW
481	AZ7000000027916	1 - 2 Miles ESE
BU482	AZ7000000027392	1 - 2 Miles SSW
BU483	AZ7000000027393	1 - 2 Miles SSW
BU484	AZ7000000027394	1 - 2 Miles SSW
BV485	AZ7000000027784	1 - 2 Miles SE
BV486	AZ7000000027785	1 - 2 Miles SE
487	AZ7000000027876	1 - 2 Miles WSW
BW488	AZ7000000028763	1 - 2 Miles NW
BW489	AZ7000000028764	1 - 2 Miles NW
490	AZ7000000027316	1 - 2 Miles South
BX491	AZ7000000028654	1 - 2 Miles WNW
BX492	AZ7000000028655	1 - 2 Miles WNW
BY493	AZ7000000027539	1 - 2 Miles SW
BY494	AZ7000000027540	1 - 2 Miles SW
BZ495	AZ7000000028568	1 - 2 Miles WNW
BZ496	AZ7000000028567	1 - 2 Miles WNW
BZ497	AZ7000000028569	1 - 2 Miles WNW

## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

### STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
BZ498	AZ7000000028571	1 - 2 Miles WNW
BZ499	AZ7000000028570	1 - 2 Miles WNW
500	AZ7000000028822	1 - 2 Miles NNW
501	AZ7000000028867	1 - 2 Miles NNE
502	AZ7000000027900	1 - 2 Miles WSW
503	AZ7000000028276	1 - 2 Miles East
CA504	AZ7000000027388	1 - 2 Miles SSW
CA505	AZ7000000027387	1 - 2 Miles SSW
CA506	AZ7000000027386	1 - 2 Miles SSW
CA507	AZ7000000027391	1 - 2 Miles SSW
CA508	AZ7000000027390	1 - 2 Miles SSW
CA509	AZ7000000027389	1 - 2 Miles SSW
510	AZ7000000028442	1 - 2 Miles East
511	AZ7000000028613	1 - 2 Miles WNW
CB512	AZ7000000027956	1 - 2 Miles WSW
CB513	AZ7000000027955	1 - 2 Miles WSW
CB514	AZ7000000027958	1 - 2 Miles WSW
CB515	AZ7000000027957	1 - 2 Miles WSW
CC516	AZ7000000028027	1 - 2 Miles ESE
CC517	AZ7000000028028	1 - 2 Miles ESE
518	AZ7000000027318	1 - 2 Miles SSE
519	AZ7000000028708	1 - 2 Miles NW
520	AZ7000000028341	1 - 2 Miles West
CD521	AZ7000000028135	1 - 2 Miles West
CD522	AZ7000000028136	1 - 2 Miles West
CD523	AZ7000000028137	1 - 2 Miles West
CE524	AZ7000000027531	1 - 2 Miles SW
CE525	AZ7000000027530	1 - 2 Miles SW
CE526	AZ7000000027529	1 - 2 Miles SW
CE527	AZ7000000027534	1 - 2 Miles SW
CE528	AZ7000000027533	1 - 2 Miles SW
CE529	AZ7000000027532	1 - 2 Miles SW
530	AZ7000000028505	1 - 2 Miles West
531	AZ7000000027915	1 - 2 Miles ESE
532	AZ7000000028293	1 - 2 Miles East
CF533	AZ7000000027992	1 - 2 Miles WSW
CF534	AZ7000000027993	1 - 2 Miles WSW

The map displays the Tucson International Airport (TUCSON INTL AIRPORT) and its surrounding urban area. A large black circle is centered on the airport, indicating a radius of approximately 10 miles. A yellow star marks the airport's location. The map includes a grid of streets, with major roads like E Drexel Rd, E Bilby Rd, E Valencia Rd, E Los Reales Rd, S Park Ave, S Country Club Rd, and F Airport Dr labeled. A large black 'X' is drawn over the airport area. Numerous blue circles with letters and numbers are scattered across the map, representing various locations or points of interest. The map also shows the Tucson International Airport terminal and runways. An inset map in the bottom right corner shows the location of Tucson within the state of Arizona.

- 
- A horizontal number line is shown with tick marks at 0,  $\frac{1}{4}$ ,  $\frac{1}{2}$ , and 1. The segment between 0 and  $\frac{1}{4}$  is highlighted in yellow.

CLIENT: B.B. & E  
CONTACT: Naila Hosein  
INQUIRY #: 4434553.2s  
DATE: October 09, 2015 4:26 pm



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**D32**  
**NW**  
**1/8 - 1/4 Mile**  
**Lower**

**FRDS PWS AZ0420418**

Epa region:	09	State:	AZ
Pwsid:	AZ0420418		
Pwsname:	AZ AIR NTL GUARD-162 TAC		
City served:	Not Reported	State served:	AZ
Zip served:	Not Reported	Fips county:	19
Status:	Closed	Pop srvd:	600
Pwssvconn:	1	Source:	Groundwater
Pws type:	TNCWS	Owner:	State_Govt
Contact:	Not Reported		
Contact gname:	Not Reported		
Contact phone:	Not Reported	Contact address1:	Not Reported
Contact address2:	1500 E VALENCIA RD	Contact city:	TUCSON
Contact state:	AZ	Contact zip:	85706
Activity code:	I		
Location Information:			
Name:	AZ AIR NTL GUARD-162 TAC		
Pwstypcd:	TNCWS	Primsrccd:	GW
Popsserved:	600		
Add1:	Not Reported		
Add2:	1500 E VALENCIA RD		
City:	TUCSON	State:	AZ
Zip:	85706	Phone:	Not Reported
Cityserv:	TUCSON	Cntysserv:	Not Reported
Stateserv:	AZ	Zipsserv:	Not Reported
PWS ID:	AZ0420418		
Date Initiated:	5805	Date Deactivated:	Not Reported
PWS Name:	AZ AIR NTL GUARD-162 TAC		
	1500 E VALENCIA		
	TUCSON, AZ		
Addressee / Facility:	System Owner/Responsible Party		
	AZ AIR NTL GUARD-162 TAC FTR G		
	1500 E VALENCIA ROAD		
	TUCSON, AZ 85706		
Facility Latitude:	32 13 18	Facility Longitude:	110 55 32
Facility Latitude:	32 07 58	Facility Longitude:	110 57 04
City Served:	IN TUCSON		
Treatment Class:	Untreated	Population:	00000600
Violations information not reported.			

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**212**  
**ENE**  
**1/2 - 1 Mile**  
**Higher**

Site ID: 007132  
Groundwater Flow: Not Reported  
Shallowest Water Table Depth: Not Reported  
Deepest Water Table Depth: Not Reported  
Average Water Table Depth: 95 ft  
Date: 01/14/1999

**AQUIFLOW 49594**

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**C33**  
**North**  
**1/8 - 1/4 Mile**  
**Lower**

Site ID: 000169  
Groundwater Flow: NW  
Shallowest Water Table Depth: 85  
Deepest Water Table Depth: 95  
Average Water Table Depth: Not Reported  
Date: 01/29/1992

**AQUIFLOW 49606**

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**490**  
**South**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS AZ7000000027316**

Program:	55	Registry i:	526845
Owner name:	LOCKHEED AEROMED CTR,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	498		
Approved:	Not Reported	Installed:	4/13/1990 12:00:00 AM
Well depth:	155		
Water leve:	130		
Casing dep:	152		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Y	Cadastral:	D15014019ACA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504835		
Utm y mete:	3553177		
Applicatio:	1/8/1990 12:00:00 AM	Site id:	AZ7000000027316

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

518  
SSE  
1 - 2 Miles  
Higher

AZ WELLS AZ7000000027318

Program:	55	Registry i:	524217
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	263		
Approved:	Not Reported	Installed:	10/17/1989 12:00:00 AM
Well depth:	146		
Water leve:	132		
Casing dep:	131		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	GASOLINE ENGINE 1 - 5 HP		
Pumprate:	1		
Testedrate:	1		
Draw down:	6		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014020BCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	20		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505440.6		
Utm y mete:	3553181		
Applicatio:	4/14/1989 12:00:00 AM	Site id:	AZ7000000027318

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**CA506**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS AZ7000000027386**

Program:	55	Registry i:	569344
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	52		
Approved:	7/13/1998 12:00:00 AM	Installed:	7/19/1998 12:00:00 AM
Well depth:	113		
Water leve:	91		
Casing dep:	113		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503824.8		
Utm y mete:	3553370		
Applicatio:	6/22/1998 12:00:00 AM	Site id:	AZ7000000027386

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**CA505**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS**

**AZ7000000027387**

Program:	55	Registry i:	593187
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	7		
Approved:	6/25/2002 12:00:00 AM	Installed:	8/5/2002 12:00:00 AM
Well depth:	115		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503824.8		
Utm y mete:	3553370		
Applicatio:	6/21/2002 12:00:00 AM	Site id:	AZ7000000027387



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**CA504**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS AZ7000000027388**

Program:	55	Registry i:	902924
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	8/22/2005 9:30:09 AM	Installed:	Not Reported
Well depth:	115		
Water leve:	0		
Casing dep:	112		
Casing dia:	8		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503824.8		
Utm y mete:	3553370		
Applicatio:	8/22/2005 9:30:09 AM	Site id:	AZ7000000027388

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**CA509**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS AZ7000000027389**

Program:	55	Registry i:	902706
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014019BBC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503824.8		
Utm y mete:	3553370		
Applicatio:	7/26/2005 8:15:42 AM	Site id:	AZ7000000027389

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**CA508**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS**

**AZ7000000027390**

Program:	55	Registry i:	902707
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	7/26/2005 8:24:35 AM	Installed:	Not Reported
Well depth:	105		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503824.8		
Utm y mete:	3553370		
Applicatio:	7/26/2005 8:24:35 AM	Site id:	AZ7000000027390

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**CA507**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS AZ7000000027391**

Program:	55	Registry i:	902709
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	7/26/2005 8:38:09 AM	Installed:	Not Reported
Well depth:	125		
Water leve:	0		
Casing dep:	0		
Casing dia:	8		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503824.8		
Utm y mete:	3553370		
Applicatio:	7/26/2005 8:38:09 AM	Site id:	AZ7000000027391

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BU482**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS AZ7000000027392**

Program:	55	Registry i:	514054
Owner name:	AIR FORCE PLANT #44,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	YES		
Well type :	MONITOR		
Dlic num:	7		
Approved:	Not Reported	Installed:	8/9/1986 12:00:00 AM
Well depth:	202		
Water leve:	110		
Casing dep:	200		
Casing dia:	12		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504026.8		
Utm y mete:	3553372		
Applicatio:	4/22/1986 12:00:00 AM	Site id:	AZ7000000027392

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BU483**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS AZ7000000027393**

Program:	55	Registry i:	513733
Owner name:	AIR FORCE PLANT #44,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	25		
Approved:	Not Reported	Installed:	7/23/1986 12:00:00 AM
Well depth:	215		
Water leve:	98		
Casing dep:	200		
Casing dia:	6		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504026.8		
Utm y mete:	3553372		
Applicatio:	3/17/1986 12:00:00 AM	Site id:	AZ7000000027393

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BU484**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS**

**AZ7000000027394**

Program:	55	Registry i:	569343
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	52		
Approved:	7/13/1998 12:00:00 AM	Installed:	8/1/1998 12:00:00 AM
Well depth:	128		
Water leve:	111		
Casing dep:	128		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504026.8		
Utm y mete:	3553372		
Applicatio:	6/22/1998 12:00:00 AM	Site id:	AZ7000000027394



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BI396**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS**

**AZ7000000027395**

Program:	55	Registry i:	571649
Owner name:	LEATJET, INC.		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	498		
Approved:	1/4/1999 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014019BAD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504430.8		
Utm y mete:	3553376		
Applicatio:	11/24/1998 12:00:00 AM	Site id:	AZ7000000027395

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BI397**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS** **AZ7000000027396**

Program:	55	Registry i:	619964
Owner name:	TUCSON, CITY OF,		
Rgr pump d:	NO	Welltype:	NON-EXEMPT
Well type :	NON-EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	7/1/1943 12:00:00 AM
Well depth:	238		
Water leve:	122		
Casing dep:	238		
Casing dia:	10		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014019BAD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504430.8		
Utm y mete:	3553376		
Applicatio:	6/9/1982 12:00:00 AM	Site id:	AZ7000000027396

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**CE526**  
**SW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000027529**

Program:	55	Registry i:	213046
Owner name:	USAF PLANT 44		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	7		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013024AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	24		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503421.8		
Utm y mete:	3553568		
Applicatio:	8/21/2006 12:00:00 AM	Site id:	AZ7000000027529

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**CE525**  
**SW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000027530**

Program:	55	Registry i:	212853
Owner name:	US AIR FORCE PLANT #44		
Rgr pump d:	NO	Welltype:	NON-EXEMPT
Well type :	NON-EXEMPT		
Dlic num:	7		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15013024AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	24		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503421.8		
Utm y mete:	3553568		
Applicatio:	7/26/2006 12:00:00 AM	Site id:	AZ7000000027530

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**CE524**  
**SW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS** **AZ7000000027531**

Program:	55	Registry i:	508352
Owner name:	U S AIR FORCE PLANT # 44		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	667		
Approved:	1/8/2007 12:00:00 AM	Installed:	7/3/1984 12:00:00 AM
Well depth:	215		
Water leve:	96		
Casing dep:	215		
Casing dia:	6		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR < 1 HP		
Pumprate:	10		
Testedrate:	10		
Draw down:	2		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013024AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	24		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503421.8		
Utm y mete:	3553568		
Applicatio:	6/11/1984 12:00:00 AM	Site id:	AZ7000000027531

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**CE529**  
**SW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000027532**

Program:	55	Registry i:	514056
Owner name:	US AIR FORCE PLANT #44		
Rgr pump d:	YES	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	7		
Approved:	Not Reported	Installed:	8/21/1986 12:00:00 AM
Well depth:	212		
Water leve:	100		
Casing dep:	210		
Casing dia:	12		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	A	Drill log:	X
Well cance:	Y	Cadastral:	D15013024AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	24		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503421.8		
Utm y mete:	3553568		
Applicatio:	4/22/1986 12:00:00 AM	Site id:	AZ7000000027532

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**CE528**  
**SW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000027533**

Program:	55	Registry i:	513731
Owner name:	US AIR FORCE PLANT #44		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	25		
Approved:	Not Reported	Installed:	5/19/1986 12:00:00 AM
Well depth:	205		
Water leve:	92		
Casing dep:	205		
Casing dia:	6		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013024AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	24		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503421.8		
Utm y mete:	3553568		
Applicatio:	3/17/1986 12:00:00 AM	Site id:	AZ7000000027533



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**CE527**  
**SW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000027534**

Program:	55	Registry i:	553145
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013024AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	24		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503421.8		
Utm y mete:	3553568		
Applicatio:	11/21/1995 12:00:00 AM	Site id:	AZ7000000027534

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BY493**  
**SW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS**

**AZ7000000027539**

Program:	55	Registry i:	553139
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013024AAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	24		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503623.4		
Utm y mete:	3553570		
Applicatio:	11/21/1995 12:00:00 AM	Site id:	AZ7000000027539

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BY494**  
**SW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS AZ7000000027540**

Program:	55	Registry i:	913307
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013024AAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	24		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503623.4		
Utm y mete:	3553570		
Applicatio:	5/31/2011 11:01:11 AM	Site id:	AZ7000000027540

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BO422**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS**

**AZ7000000027541**

Program:	55	Registry i:	507248
Owner name:	TUCSON WATER		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	342		
Approved:	Not Reported	Installed:	6/26/1984 12:00:00 AM
Well depth:	202		
Water leve:	103		
Casing dep:	190		
Casing dia:	16		
Casing typ:	PLASTIC OR PVC		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR 1 - 5 HP		
Pumprate:	57		
Testedrate:	57		
Draw down:	2		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.3		
Utm y mete:	3553572		
Applicatio:	2/17/1984 12:00:00 AM	Site id:	AZ7000000027541

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BO423**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS AZ7000000027542**

Program:	55	Registry i:	514055
Owner name:	AIR FORCE PLANT #44,		
Rgr pump d:	YES	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	7		
Approved:	Not Reported	Installed:	11/3/1986 12:00:00 AM
Well depth:	207		
Water leve:	120		
Casing dep:	200		
Casing dia:	24		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.3		
Utm y mete:	3553572		
Applicatio:	4/22/1986 12:00:00 AM	Site id:	AZ7000000027542

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BO424**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS AZ7000000027543**

Program:	55	Registry i:	513732
Owner name:	AIR FORCE PLANT #44,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	25		
Approved:	Not Reported	Installed:	7/22/1986 12:00:00 AM
Well depth:	220		
Water leve:	95		
Casing dep:	220		
Casing dia:	6		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.3		
Utm y mete:	3553572		
Applicatio:	3/17/1986 12:00:00 AM	Site id:	AZ7000000027543

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BO421**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS**

**AZ7000000027544**

Program:	55	Registry i:	555274
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	3/21/1996 12:00:00 AM
Well depth:	125		
Water leve:	90		
Casing dep:	121		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.3		
Utm y mete:	3553572		
Applicatio:	2/23/1996 12:00:00 AM	Site id:	AZ7000000027544

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BO418**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS**

**AZ7000000027545**

Program:	55	Registry i:	562569
Owner name:	TUCSON AIRPORT AUTH,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	6/17/1997 12:00:00 AM
Well depth:	117		
Water leve:	90		
Casing dep:	113		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.3		
Utm y mete:	3553572		
Applicatio:	5/12/1997 12:00:00 AM	Site id:	AZ7000000027545



## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BO419**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS AZ7000000027546**

Program:	55	Registry i:	569348
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	52		
Approved:	7/13/1998 12:00:00 AM	Installed:	8/14/1998 12:00:00 AM
Well depth:	95		
Water leve:	0		
Casing dep:	85		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.3		
Utm y mete:	3553572		
Applicatio:	6/22/1998 12:00:00 AM	Site id:	AZ7000000027546

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BO420**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS AZ7000000027547**

Program:	55	Registry i:	593188
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	6/25/2002 12:00:00 AM	Installed:	1/14/2003 12:00:00 AM
Well depth:	141		
Water leve:	90		
Casing dep:	135		
Casing dia:	0		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.3		
Utm y mete:	3553572		
Applicatio:	6/21/2002 12:00:00 AM	Site id:	AZ7000000027547

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BO429**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS AZ7000000027548**

Program:	55	Registry i:	593189
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	6/25/2002 12:00:00 AM	Installed:	10/24/2002 12:00:00 AM
Well depth:	120		
Water leve:	109		
Casing dep:	120		
Casing dia:	0		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.3		
Utm y mete:	3553572		
Applicatio:	6/21/2002 12:00:00 AM	Site id:	AZ7000000027548

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BO430**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS AZ7000000027549**

Program:	55	Registry i:	593245
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	7		
Approved:	6/28/2002 12:00:00 AM	Installed:	7/25/2002 12:00:00 AM
Well depth:	125		
Water leve:	0		
Casing dep:	0		
Casing dia:	10		
Casing typ:	NO CASING CODE LISTED		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.3		
Utm y mete:	3553572		
Applicatio:	6/24/2002 12:00:00 AM	Site id:	AZ7000000027549

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database      EDR ID Number

**BO431**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS      AZ7000000027550**

Program:	55	Registry i:	593246
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	7		
Approved:	6/28/2002 12:00:00 AM	Installed:	8/2/2002 12:00:00 AM
Well depth:	123		
Water leve:	0		
Casing dep:	0		
Casing dia:	10		
Casing typ:	NO CASING CODE LISTED		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.3		
Utm y mete:	3553572		
Applicatio:	6/24/2002 12:00:00 AM	Site id:	AZ7000000027550

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BO428**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS**

**AZ7000000027551**

Program:	55	Registry i:	902708
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	7/26/2005 8:31:22 AM	Installed:	Not Reported
Well depth:	130		
Water leve:	0		
Casing dep:	108		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.3		
Utm y mete:	3553572		
Applicatio:	7/26/2005 8:31:22 AM	Site id:	AZ7000000027551

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BO425**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS AZ7000000027552**

Program:	55	Registry i:	902711
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	7/26/2005 9:08:02 AM	Installed:	7/22/2005 12:00:00 AM
Well depth:	125		
Water leve:	0		
Casing dep:	108		
Casing dia:	8		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.3		
Utm y mete:	3553572		
Applicatio:	7/26/2005 9:08:02 AM	Site id:	AZ7000000027552

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BO426**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS**

**AZ7000000027553**

Program:	55	Registry i:	902712
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	7/26/2005 9:14:49 AM	Installed:	Not Reported
Well depth:	125		
Water leve:	0		
Casing dep:	125		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.3		
Utm y mete:	3553572		
Applicatio:	7/26/2005 9:14:49 AM	Site id:	AZ7000000027553



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BO427**  
**SSW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS**

**AZ7000000027554**

Program:	55	Registry i:	902714
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	7/26/2005 9:21:25 AM	Installed:	Not Reported
Well depth:	105		
Water leve:	0		
Casing dep:	0		
Casing dia:	8		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.3		
Utm y mete:	3553572		
Applicatio:	7/26/2005 9:21:25 AM	Site id:	AZ7000000027554

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

348  
SSW  
1/2 - 1 Mile  
Higher

AZ WELLS

AZ7000000027555

Program:	55	Registry i:	508347
Owner name:	HUGHES AIRCRAFT CO,		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	25		
Approved:	Not Reported	Installed:	6/30/1984 12:00:00 AM
Well depth:	220		
Water leve:	120		
Casing dep:	220		
Casing dia:	6		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR < 1 HP		
Pumprate:	10		
Testedrate:	10		
Draw down:	9		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014019BAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	19		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504228.8		
Utm y mete:	3553576		
Applicatio:	6/11/1984 12:00:00 AM	Site id:	AZ7000000027555

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BL406**  
**SW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS**

**AZ7000000027636**

Program:	55	Registry i:	507249
Owner name:	TUCSON WATER	Welltype:	EXPLORATION
Rgr pump d:	NO		
Well type :	OTHER		
Dlic num:	342		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15013013DDD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	503623.9		
Utm y mete:	3553773		
Applicatio:	2/17/1984 12:00:00 AM	Site id:	AZ7000000027636

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BL405**  
**SW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS AZ7000000027637**

Program:	55	Registry i:	549308
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15013013DDD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	503623.9		
Utm y mete:	3553773		
Applicatio:	5/26/1995 12:00:00 AM	Site id:	AZ7000000027637

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BL404**  
**SW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS AZ7000000027638**

Program:	55	Registry i:	555270
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	3/6/1996 12:00:00 AM
Well depth:	130		
Water leve:	90		
Casing dep:	110		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013DDD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	503623.9		
Utm y mete:	3553773		
Applicatio:	2/23/1996 12:00:00 AM	Site id:	AZ7000000027638

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BL409**  
**SW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS**

**AZ7000000027639**

Program:	55	Registry i:	593191
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	6/25/2002 12:00:00 AM	Installed:	6/25/2003 12:00:00 AM
Well depth:	113		
Water leve:	96		
Casing dep:	113		
Casing dia:	9		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	A	Drill log:	X
Well cance:	Y	Cadastral:	D15013013DDD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	503623.9		
Utm y mete:	3553773		
Applicatio:	6/21/2002 12:00:00 AM	Site id:	AZ7000000027639

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BL408**  
**SW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS**

**AZ7000000027640**

Program:	55	Registry i:	593192
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	7		
Approved:	6/25/2002 12:00:00 AM	Installed:	10/22/2002 12:00:00 AM
Well depth:	130		
Water leve:	0		
Casing dep:	0		
Casing dia:	10		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013DDD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	503623.9		
Utm y mete:	3553773		
Applicatio:	6/21/2002 12:00:00 AM	Site id:	AZ7000000027640

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BL407**  
**SW**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS AZ7000000027641**

Program:	55	Registry i:	913084
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013013DDD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	503623.9		
Utm y mete:	3553773		
Applicatio:	3/24/2011 9:38:49 PM	Site id:	AZ7000000027641



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BF369**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027642**

Program:	55	Registry i:	528092
Owner name:	TUCSON AIRPORT AUTH,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	263	Installed:	Not Reported
Approved:	Not Reported		
Well depth:	103		
Water leve:	0		
Casing dep:	0		
Casing dia:	11		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018CCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.8		
Utm y mete:	3553775		
Applicatio:	5/11/1990 12:00:00 AM	Site id:	AZ7000000027642

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BF368**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027643**

Program:	55	Registry i:	529023
Owner name:	TUCSON AIRPORT AUTH,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	263		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018CCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.8		
Utm y mete:	3553775		
Applicatio:	8/9/1990 12:00:00 AM	Site id:	AZ7000000027643

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BF370**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027644**

Program:	55	Registry i:	533005
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	533		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018CCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.8		
Utm y mete:	3553775		
Applicatio:	9/10/1991 12:00:00 AM	Site id:	AZ7000000027644

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BF372**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027645**

Program:	55	Registry i:	533006
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	533		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018CCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.8		
Utm y mete:	3553775		
Applicatio:	9/10/1991 12:00:00 AM	Site id:	AZ7000000027645

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BF371**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027646**

Program:	55	Registry i:	533007
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	533		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018CCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.8		
Utm y mete:	3553775		
Applicatio:	9/11/1991 12:00:00 AM	Site id:	AZ7000000027646

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BF364**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027647**

Program:	55	Registry i:	533008
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	533		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018CCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.8		
Utm y mete:	3553775		
Applicatio:	9/10/1991 12:00:00 AM	Site id:	AZ7000000027647

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BF363**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027648**

Program:	55	Registry i:	535761
Owner name:	TUCSON AIRPORT AUTH,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	10/9/1992 12:00:00 AM
Well depth:	156		
Water leve:	112		
Casing dep:	156		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	SUBMERSIBLE		
Pump power:	NO POWER CODE LISTED		
Pumprate:	1		
Testedrate:	0		
Draw down:	0		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.8		
Utm y mete:	3553775		
Applicatio:	6/24/1992 12:00:00 AM	Site id:	AZ7000000027648

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BF365**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027649**

Program:	55	Registry i:	535763
Owner name:	TUCSON AIRPORT AUTH,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	10/7/1992 12:00:00 AM
Well depth:	100		
Water leve:	94		
Casing dep:	100		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	1		
Testedrate:	0		
Draw down:	5		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.8		
Utm y mete:	3553775		
Applicatio:	6/24/1992 12:00:00 AM	Site id:	AZ7000000027649



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BF367**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027650**

Program:	55	Registry i:	535764
Owner name:	TUCSON AIRPORT AUTH,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	9/25/1992 12:00:00 AM
Well depth:	115		
Water leve:	90		
Casing dep:	115		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	1		
Testedrate:	0		
Draw down:	1		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.8		
Utm y mete:	3553775		
Applicatio:	6/24/1992 12:00:00 AM	Site id:	AZ7000000027650

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BF366**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027651**

Program:	55	Registry i:	535765
Owner name:	TUCSON AIRPORT AUTH,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	10/7/1992 12:00:00 AM
Well depth:	100		
Water leve:	86		
Casing dep:	100		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	1		
Testedrate:	0		
Draw down:	5		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.8		
Utm y mete:	3553775		
Applicatio:	6/24/1992 12:00:00 AM	Site id:	AZ7000000027651

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BF379**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027652**

Program:	55	Registry i:	535766
Owner name:	TUCSON AIRPORT AUTH,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	9/23/1992 12:00:00 AM
Well depth:	105		
Water leve:	86		
Casing dep:	104		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	1		
Testedrate:	0		
Draw down:	5		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.8		
Utm y mete:	3553775		
Applicatio:	6/24/1992 12:00:00 AM	Site id:	AZ7000000027652

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BF378**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027653**

Program:	55	Registry i:	548146
Owner name:	TUCSON AIRPORT AUTHO,R I		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	4/22/1995 12:00:00 AM
Well depth:	98		
Water leve:	92		
Casing dep:	87		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.8		
Utm y mete:	3553775		
Applicatio:	4/6/1995 12:00:00 AM	Site id:	AZ7000000027653

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BF380**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027654**

Program:	55	Registry i:	555273
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	3/19/1997 12:00:00 AM
Well depth:	119		
Water leve:	90		
Casing dep:	107		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.8		
Utm y mete:	3553775		
Applicatio:	2/23/1996 12:00:00 AM	Site id:	AZ7000000027654

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BF382**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS** **AZ7000000027655**

Program:	55	Registry i:	593255
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	7		
Approved:	7/3/2002 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018CCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.8		
Utm y mete:	3553775		
Applicatio:	6/24/2002 12:00:00 AM	Site id:	AZ7000000027655

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BF381**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027656**

Program:	55	Registry i:	593256
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	7		
Approved:	7/3/2002 12:00:00 AM	Installed:	11/4/2002 12:00:00 AM
Well depth:	130		
Water leve:	0		
Casing dep:	0		
Casing dia:	10		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.8		
Utm y mete:	3553775		
Applicatio:	6/24/2002 12:00:00 AM	Site id:	AZ7000000027656

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BF374**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027657**

Program:	55	Registry i:	593179
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	8/2/2002 12:00:00 AM	Installed:	8/27/2002 12:00:00 AM
Well depth:	110		
Water leve:	91		
Casing dep:	110		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.8		
Utm y mete:	3553775		
Applicatio:	6/21/2002 12:00:00 AM	Site id:	AZ7000000027657



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BF373**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027658**

Program:	55	Registry i:	593180
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	8/2/2002 12:00:00 AM	Installed:	10/3/2002 12:00:00 AM
Well depth:	120		
Water leve:	105		
Casing dep:	114		
Casing dia:	8		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.8		
Utm y mete:	3553775		
Applicatio:	6/21/2002 12:00:00 AM	Site id:	AZ7000000027658

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BF375**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027659**

Program:	55	Registry i:	598557
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018CCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.8		
Utm y mete:	3553775		
Applicatio:	5/16/2003 12:00:00 AM	Site id:	AZ7000000027659

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BF377**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027660**

Program:	55	Registry i:	599921
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	PIEZOMETER
Well type :	MONITOR		
Dlic num:	7		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018CCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.8		
Utm y mete:	3553775		
Applicatio:	8/12/2003 12:00:00 AM	Site id:	AZ7000000027660

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BF376**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027661**

Program:	55	Registry i:	599922
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018CCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.8		
Utm y mete:	3553775		
Applicatio:	8/12/2003 12:00:00 AM	Site id:	AZ7000000027661

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AY327**  
**SSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027662**

Program:	55	Registry i:	208225
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	INJECTION
Well type :	NON-EXEMPT		
Dlic num:	83		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018CCD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504027.7		
Utm y mete:	3553777		
Applicatio:	6/15/2005 12:00:00 AM	Site id:	AZ7000000027662

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AY328**  
**SSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027663**

Program:	55	Registry i:	535762
Owner name:	TUCSON AIRPORT AUTH,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	10/24/1992 12:00:00 AM
Well depth:	103		
Water leve:	90		
Casing dep:	103		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	1		
Testedrate:	0		
Draw down:	5		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504027.7		
Utm y mete:	3553777		
Applicatio:	6/24/1992 12:00:00 AM	Site id:	AZ7000000027663

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AY329**  
**SSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027664**

Program:	55	Registry i:	555272
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	3/10/1996 12:00:00 AM
Well depth:	106		
Water leve:	90		
Casing dep:	106		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504027.7		
Utm y mete:	3553777		
Applicatio:	2/23/1996 12:00:00 AM	Site id:	AZ7000000027664

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**290**  
**SSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027665**

Program:	55	Registry i:	548220
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	5/23/1995 12:00:00 AM
Well depth:	173		
Water leve:	114		
Casing dep:	168		
Casing dia:	12		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CDC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	504229.3		
Utm y mete:	3553779		
Applicatio:	3/14/1995 12:00:00 AM	Site id:	AZ7000000027665



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**247**  
**South**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027666**

Program:	55	Registry i:	209879
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018DCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	504632.7		
Utm y mete:	3553782		
Applicatio:	10/24/2005 12:00:00 AM	Site id:	AZ7000000027666

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**410**  
**SW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000027685**

Program:	55	Registry i:	585096
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	161		
Approved:	1/23/2001 12:00:00 AM	Installed:	9/26/2001 12:00:00 AM
Well depth:	120		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013DD0
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	Not Reported	Qacre10dir:	Not Reported
Utm x mete:	503523.2		
Utm y mete:	3553873		
Applicatio:	1/9/2001 12:00:00 AM	Site id:	AZ7000000027685

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BN415**  
**SW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000027729**

Program:	55	Registry i:	522254
Owner name:	SOUTHWEST GAS CORP,		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	499		
Approved:	Not Reported	Installed:	10/25/1988 12:00:00 AM
Well depth:	228		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013DDB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503422.4		
Utm y mete:	3553974		
Applicatio:	9/9/1988 12:00:00 AM	Site id:	AZ7000000027729

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BN414**  
**SW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000027730**

Program:	55	Registry i:	553140
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013013DDB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503422.4		
Utm y mete:	3553974		
Applicatio:	11/21/1995 12:00:00 AM	Site id:	AZ7000000027730

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BN417**  
**SW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000027731**

Program:	55	Registry i:	553143
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013013DDB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503422.4		
Utm y mete:	3553974		
Applicatio:	11/21/1995 12:00:00 AM	Site id:	AZ7000000027731

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BN416**  
**SW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000027732**

Program:	55	Registry i:	565452
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	473		
Approved:	11/21/1997 12:00:00 AM	Installed:	11/12/1997 12:00:00 AM
Well depth:	130		
Water leve:	93		
Casing dep:	0		
Casing dia:	10		
Casing typ:	NO CASING CODE LISTED		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	A	Drill log:	X
Well cance:	Y	Cadastral:	D15013013DDB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503422.4		
Utm y mete:	3553974		
Applicatio:	10/27/1997 12:00:00 AM	Site id:	AZ7000000027732

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BD353**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027735**

Program:	55	Registry i:	504629
Owner name:	AROS, VICTOR,		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	25		
Approved:	Not Reported	Installed:	1/31/1983 12:00:00 AM
Well depth:	218		
Water leve:	103		
Casing dep:	218		
Casing dia:	10		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR < 1 HP		
Pumprate:	12		
Testedrate:	12		
Draw down:	0		
Completion:	X	Drill log:	X
Well cance:	Y	Cadastral:	D15013013DDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503624		
Utm y mete:	3553976		
Applicatio:	1/13/1983 12:00:00 AM	Site id:	AZ7000000027735

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BD354**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027736**

Program:	55	Registry i:	553144
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013013DDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503624		
Utm y mete:	3553976		
Applicatio:	11/21/1995 12:00:00 AM	Site id:	AZ7000000027736



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BD355**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027737**

Program:	55	Registry i:	552448
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013013DDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503624		
Utm y mete:	3553976		
Applicatio:	10/3/1995 12:00:00 AM	Site id:	AZ7000000027737

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BD350**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027738**

Program:	55	Registry i:	565319
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	473		
Approved:	11/6/1997 12:00:00 AM	Installed:	11/9/1997 12:00:00 AM
Well depth:	120		
Water leve:	93		
Casing dep:	119		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013DDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503624		
Utm y mete:	3553976		
Applicatio:	10/29/1997 12:00:00 AM	Site id:	AZ7000000027738

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BD351**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027739**

Program:	55	Registry i:	588091
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	PIEZOMETER
Well type :	MONITOR		
Dlic num:	7		
Approved:	8/2/2001 12:00:00 AM	Installed:	8/14/2001 12:00:00 AM
Well depth:	126		
Water leve:	95		
Casing dep:	116		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013DDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503624		
Utm y mete:	3553976		
Applicatio:	7/23/2001 12:00:00 AM	Site id:	AZ7000000027739

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BD352**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027740**

Program:	55	Registry i:	589886
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	11/28/2001 12:00:00 AM	Installed:	12/4/2001 12:00:00 AM
Well depth:	118		
Water leve:	95		
Casing dep:	107		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013DDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503624		
Utm y mete:	3553976		
Applicatio:	11/15/2001 12:00:00 AM	Site id:	AZ7000000027740

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BD359**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027741**

Program:	55	Registry i:	589887
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	11/28/2001 12:00:00 AM	Installed:	12/7/2001 12:00:00 AM
Well depth:	125		
Water leve:	95		
Casing dep:	120		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013DDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503624		
Utm y mete:	3553976		
Applicatio:	11/15/2001 12:00:00 AM	Site id:	AZ7000000027741

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BD360**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027742**

Program:	55	Registry i:	589888
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	11/28/2001 12:00:00 AM	Installed:	12/5/2001 12:00:00 AM
Well depth:	125		
Water leve:	95		
Casing dep:	124		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013DDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503624		
Utm y mete:	3553976		
Applicatio:	11/15/2001 12:00:00 AM	Site id:	AZ7000000027742

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BD361**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027743**

Program:	55	Registry i:	589031
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	YES	Welltype:	WITHDRAWAL PERMIT
Well type :	NON-EXEMPT		
Dlic num:	7		
Approved:	12/11/2001 12:00:00 AM	Installed:	12/13/2001 12:00:00 AM
Well depth:	125		
Water leve:	95		
Casing dep:	125		
Casing dia:	8		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013DDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503624		
Utm y mete:	3553976		
Applicatio:	12/11/2001 12:00:00 AM	Site id:	AZ7000000027743

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BD356**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027744**

Program:	55	Registry i:	593190
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	6/25/2002 12:00:00 AM	Installed:	8/23/2002 12:00:00 AM
Well depth:	125		
Water leve:	0		
Casing dep:	123		
Casing dia:	13		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	A	Drill log:	X
Well cance:	Y	Cadastral:	D15013013DDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503624		
Utm y mete:	3553976		
Applicatio:	6/21/2002 12:00:00 AM	Site id:	AZ7000000027744



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BD357**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027745**

Program:	55	Registry i:	585095
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	161		
Approved:	1/23/2001 12:00:00 AM	Installed:	9/25/2001 12:00:00 AM
Well depth:	125		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013DDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503624		
Utm y mete:	3553976		
Applicatio:	1/9/2001 12:00:00 AM	Site id:	AZ7000000027745

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BD358**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027746**

Program:	55	Registry i:	596118
Owner name:	TUCSON, CITY OF, Airport Authority		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	11/27/2002 12:00:00 AM	Installed:	1/20/2003 12:00:00 AM
Well depth:	124		
Water leve:	91		
Casing dep:	124		
Casing dia:	8		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013DDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503624		
Utm y mete:	3553976		
Applicatio:	11/22/2002 12:00:00 AM	Site id:	AZ7000000027746

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AT300**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027747**

Program:	55	Registry i:	208226
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	PIEZOMETER
Well type :	MONITOR		
Dlic num:	83		
Approved:	6/29/2005 12:00:00 AM	Installed:	Not Reported
Well depth:	125		
Water leve:	0		
Casing dep:	110		
Casing dia:	8		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.7		
Utm y mete:	3553978		
Applicatio:	6/15/2005 12:00:00 AM	Site id:	AZ7000000027747

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AT301**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027748**

Program:	55	Registry i:	218986
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	PIEZOMETER
Well type :	MONITOR		
Dlic num:	83		
Approved:	Not Reported	Installed:	10/15/2008 12:00:00 AM
Well depth:	125		
Water leve:	97		
Casing dep:	95		
Casing dia:	3		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.7		
Utm y mete:	3553978		
Applicatio:	6/4/2009 12:00:00 AM	Site id:	AZ7000000027748

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AT302**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027749**

Program:	55	Registry i:	540972
Owner name:	TUCSON AIRPORT,	Welltype:	EXPLORATION
Rgr pump d:	NO		
Well type :	OTHER		
Dlic num:	473		
Approved:	Not Reported	Installed:	11/7/1996 12:00:00 AM
Well depth:	115		
Water leve:	96		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Y	Cadastral:	D15014018CCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.7		
Utm y mete:	3553978		
Applicatio:	10/15/1993 12:00:00 AM	Site id:	AZ7000000027749

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AT297**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027750**

Program:	55	Registry i:	548229
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	4/13/1995 12:00:00 AM
Well depth:	107		
Water leve:	95		
Casing dep:	107		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.7		
Utm y mete:	3553978		
Applicatio:	3/14/1995 12:00:00 AM	Site id:	AZ7000000027750

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AT298**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027751**

Program:	55	Registry i:	548231
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	4/20/1995 12:00:00 AM
Well depth:	104		
Water leve:	92		
Casing dep:	104		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.7		
Utm y mete:	3553978		
Applicatio:	3/14/1995 12:00:00 AM	Site id:	AZ7000000027751

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AT299**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027752**

Program:	55	Registry i:	549309
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018CCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.7		
Utm y mete:	3553978		
Applicatio:	5/26/1995 12:00:00 AM	Site id:	AZ7000000027752



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AT303**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027753**

Program:	55	Registry i:	593259
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	7		
Approved:	7/2/2002 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018CCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.7		
Utm y mete:	3553978		
Applicatio:	6/24/2002 12:00:00 AM	Site id:	AZ7000000027753

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AT307**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027754**

Program:	55	Registry i:	593175
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	7/30/2002 12:00:00 AM	Installed:	8/29/2002 12:00:00 AM
Well depth:	125		
Water leve:	91		
Casing dep:	125		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.7		
Utm y mete:	3553978		
Applicatio:	6/21/2002 12:00:00 AM	Site id:	AZ7000000027754

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AT308**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027755**

Program:	55	Registry i:	593176
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	7/30/2002 12:00:00 AM	Installed:	9/30/2002 12:00:00 AM
Well depth:	120		
Water leve:	124		
Casing dep:	120		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.7		
Utm y mete:	3553978		
Applicatio:	6/21/2002 12:00:00 AM	Site id:	AZ7000000027755

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AT309**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027756**

Program:	55	Registry i:	593177
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	7/30/2002 12:00:00 AM	Installed:	8/20/2002 12:00:00 AM
Well depth:	125		
Water leve:	91		
Casing dep:	124		
Casing dia:	11		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.7		
Utm y mete:	3553978		
Applicatio:	6/21/2002 12:00:00 AM	Site id:	AZ7000000027756

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AT304**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027757**

Program:	55	Registry i:	593178
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	7/30/2002 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018CCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.7		
Utm y mete:	3553978		
Applicatio:	6/21/2002 12:00:00 AM	Site id:	AZ7000000027757

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AT305**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027758**

Program:	55	Registry i:	909889
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	83		
Approved:	10/10/2008 10:46:45 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018CCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.7		
Utm y mete:	3553978		
Applicatio:	10/10/2008 10:46:45 AM	Site id:	AZ7000000027758

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AT306**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027759**

Program:	55	Registry i:	909894
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	10/10/2008 4:55:36 PM	Installed:	10/24/2008 12:00:00 AM
Well depth:	125		
Water leve:	97		
Casing dep:	118		
Casing dia:	1		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.7		
Utm y mete:	3553978		
Applicatio:	10/10/2008 4:55:36 PM	Site id:	AZ7000000027759

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AN267**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027760**

Program:	55	Registry i:	205071
Owner name:	CITY OF TUCSON ENVIRONMENTAL SERVICES		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	0		
Approved:	Not Reported	Installed:	3/16/1996 12:00:00 AM
Well depth:	130		
Water leve:	90		
Casing dep:	130		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027.4		
Utm y mete:	3553979		
Applicatio:	Not Reported	Site id:	AZ7000000027760



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AN266**

**SW**

**1/2 - 1 Mile  
Higher**

**AZ WELLS**

**AZ7000000027761**

Program:	55	Registry i:	540973
Owner name:	TUCSON AIRPORT,		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	473		
Approved:	Not Reported	Installed:	11/5/1993 12:00:00 AM
Well depth:	120		
Water leve:	101		
Casing dep:	120		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Y	Cadastral:	D15014018CCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027.4		
Utm y mete:	3553979		
Applicatio:	10/15/1993 12:00:00 AM	Site id:	AZ7000000027761

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AN269**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027762**

Program:	55	Registry i:	548227
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	4/10/1993 12:00:00 AM
Well depth:	103		
Water leve:	93		
Casing dep:	103		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027.4		
Utm y mete:	3553979		
Applicatio:	3/14/1995 12:00:00 AM	Site id:	AZ7000000027762

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AN268**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027763**

Program:	55	Registry i:	548228
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	4/6/1995 12:00:00 AM
Well depth:	100		
Water leve:	90		
Casing dep:	100		
Casing dia:	2		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027.4		
Utm y mete:	3553979		
Applicatio:	3/14/1995 12:00:00 AM	Site id:	AZ7000000027763

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AN265**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027764**

Program:	55	Registry i:	555271
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	3/8/1996 12:00:00 AM
Well depth:	106		
Water leve:	89		
Casing dep:	104		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027.4		
Utm y mete:	3553979		
Applicatio:	2/23/1996 12:00:00 AM	Site id:	AZ7000000027764

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AN262**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027765**

Program:	55	Registry i:	555469
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	3/12/1996 12:00:00 AM
Well depth:	130		
Water leve:	105		
Casing dep:	130		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027.4		
Utm y mete:	3553979		
Applicatio:	2/27/1996 12:00:00 AM	Site id:	AZ7000000027765

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AN261**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027766**

Program:	55	Registry i:	555470
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	3/13/1996 12:00:00 AM
Well depth:	105		
Water leve:	90		
Casing dep:	102		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027.4		
Utm y mete:	3553979		
Applicatio:	2/27/1996 12:00:00 AM	Site id:	AZ7000000027766

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AN264**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027767**

Program:	55	Registry i:	555471
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	3/14/1996 12:00:00 AM
Well depth:	105		
Water leve:	90		
Casing dep:	105		
Casing dia:	1		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027.4		
Utm y mete:	3553979		
Applicatio:	2/27/1996 12:00:00 AM	Site id:	AZ7000000027767

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AN263**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027768**

Program:	55	Registry i:	555472
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	3/12/1996 12:00:00 AM
Well depth:	105		
Water leve:	95		
Casing dep:	105		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027.4		
Utm y mete:	3553979		
Applicatio:	2/27/1996 12:00:00 AM	Site id:	AZ7000000027768



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AN270**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027769**

Program:	55	Registry i:	569197
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	22		
Approved:	6/26/1998 12:00:00 AM	Installed:	7/2/1998 12:00:00 AM
Well depth:	126		
Water leve:	111		
Casing dep:	116		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027.4		
Utm y mete:	3553979		
Applicatio:	6/15/1998 12:00:00 AM	Site id:	AZ7000000027769

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AN277**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027770**

Program:	55	Registry i:	593258
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	7		
Approved:	7/2/2002 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018CCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027.4		
Utm y mete:	3553979		
Applicatio:	6/24/2002 12:00:00 AM	Site id:	AZ7000000027770

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AN276**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027771**

Program:	55	Registry i:	593181
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	7/30/2002 12:00:00 AM	Installed:	9/16/2002 12:00:00 AM
Well depth:	130		
Water leve:	124		
Casing dep:	130		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027.4		
Utm y mete:	3553979		
Applicatio:	6/21/2002 12:00:00 AM	Site id:	AZ7000000027771

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AN279**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027772**

Program:	55	Registry i:	593182
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	7/30/2002 12:00:00 AM	Installed:	9/25/2002 12:00:00 AM
Well depth:	132		
Water leve:	124		
Casing dep:	120		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027.4		
Utm y mete:	3553979		
Applicatio:	6/21/2002 12:00:00 AM	Site id:	AZ7000000027772

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AN278**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027773**

Program:	55	Registry i:	593183
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	7/30/2002 12:00:00 AM	Installed:	9/19/2002 12:00:00 AM
Well depth:	132		
Water leve:	124		
Casing dep:	130		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027.4		
Utm y mete:	3553979		
Applicatio:	6/21/2002 12:00:00 AM	Site id:	AZ7000000027773

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AN275**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027774**

Program:	55	Registry i:	914167
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	VADOSE ZONE
Well type :	OTHER		
Dlic num:	83		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018CCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027.4		
Utm y mete:	3553979		
Applicatio:	3/24/2012 2:44:22 PM	Site id:	AZ7000000027774

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AN272**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027775**

Program:	55	Registry i:	914168
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	VADOSE ZONE
Well type :	OTHER		
Dlic num:	83		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018CCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027.4		
Utm y mete:	3553979		
Applicatio:	3/24/2012 2:50:21 PM	Site id:	AZ7000000027775

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AN271**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027776**

Program:	55	Registry i:	914169
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	VADOSE ZONE
Well type :	OTHER		
Dlic num:	83		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018CCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027.4		
Utm y mete:	3553979		
Applicatio:	3/24/2012 2:55:44 PM	Site id:	AZ7000000027776



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AN274**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027777**

Program:	55	Registry i:	914170
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	VADOSE ZONE
Well type :	OTHER		
Dlic num:	83		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018CCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027.4		
Utm y mete:	3553979		
Applicatio:	3/24/2012 3:00:32 PM	Site id:	AZ7000000027777

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AN273**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027778**

Program:	55	Registry i:	909890
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	10/10/2008 10:58:17 AM	Installed:	10/21/2008 12:00:00 AM
Well depth:	125		
Water leve:	97		
Casing dep:	85		
Casing dia:	3		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027.4		
Utm y mete:	3553979		
Applicatio:	10/10/2008 10:58:17 AM	Site id:	AZ7000000027778

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

233  
SSW  
1/2 - 1 Mile  
Higher

AZ WELLS AZ7000000027779

Program:	55	Registry i:	555275
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	3/31/1996 12:00:00 AM
Well depth:	126		
Water leve:	90		
Casing dep:	115		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CDB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504229		
Utm y mete:	3553981		
Applicatio:	2/23/1996 12:00:00 AM	Site id:	AZ7000000027779

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BV485**  
**SE**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS**

**AZ7000000027784**

Program:	55	Registry i:	805703
Owner name:	TUCSON AIRPORT AUTH,	Welltype:	EXEMPT
Rgr pump d:	NO		
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	10		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014017DCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	506258.8		
Utm y mete:	3553987		
Applicatio:	2/26/1990 12:00:00 AM	Site id:	AZ7000000027784

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BV486**  
**SE**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS**

**AZ7000000027785**

Program:	55	Registry i:	805704
Owner name:	TUCSON AIRPORT AUTH,		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	10		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014017DCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	506258.8		
Utm y mete:	3553987		
Applicatio:	2/26/1990 12:00:00 AM	Site id:	AZ7000000027785

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BA334**  
**SE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027792**

Program:	55	Registry i:	587998
Owner name:	US EPA REGION 9		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	161		
Approved:	7/26/2001 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014017CDB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505849.6		
Utm y mete:	3553989		
Applicatio:	7/19/2001 12:00:00 AM	Site id:	AZ7000000027792

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BA333**  
**SE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027793**

Program:	55	Registry i:	584035
Owner name:	ENVIRONMENTAL PROTECTION AGENCY REGION IX SUPERFUND DIV		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	611		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014017CDB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505849.6		
Utm y mete:	3553989		
Applicatio:	10/23/2000 12:00:00 AM	Site id:	AZ7000000027793

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BA335**  
**SE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027794**

Program:	55	Registry i:	584036
Owner name:	ENVIRONMENTAL PROTECTION AGENCY REGION IX SUPERFUND DIV		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	611		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014017CDB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505849.6		
Utm y mete:	3553989		
Applicatio:	10/23/2000 12:00:00 AM	Site id:	AZ7000000027794



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BA337**  
**SE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027795**

Program:	55	Registry i:	581058
Owner name:	ENVIRONMENTAL PROTECTION AGENCY REGION IX SUPERFUND DIV		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	611		
Approved:	5/12/2000 12:00:00 AM	Installed:	6/9/2000 12:00:00 AM
Well depth:	130		
Water leve:	98		
Casing dep:	130		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017CDB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505849.6		
Utm y mete:	3553989		
Applicatio:	5/5/2000 12:00:00 AM	Site id:	AZ7000000027795

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BA336**  
**SE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027796**

Program:	55	Registry i:	581059
Owner name:	ENVIRONMENTAL PROTECTION AGENCY REGION IX SUPERFUND DIV		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	611		
Approved:	5/12/2000 12:00:00 AM	Installed:	6/16/2000 12:00:00 AM
Well depth:	130		
Water leve:	98		
Casing dep:	130		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017CDB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505849.6		
Utm y mete:	3553989		
Applicatio:	5/5/2000 12:00:00 AM	Site id:	AZ7000000027796

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AQ287**  
**SE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027799**

Program:	55	Registry i:	529464
Owner name:	TUCSON AIRPORT,		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	498		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	85		
Water leve:	0		
Casing dep:	0		
Casing dia:	7		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014017CCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	505644.9		
Utm y mete:	3553990		
Applicatio:	9/10/1990 12:00:00 AM	Site id:	AZ7000000027799

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AQ288**  
**SE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027800**

Program:	55	Registry i:	542457
Owner name:	TUCSON AIRPORT AUTHY,		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	498		
Approved:	Not Reported	Installed:	3/23/1994 12:00:00 AM
Well depth:	110		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017CCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	505644.9		
Utm y mete:	3553990		
Applicatio:	2/25/1994 12:00:00 AM	Site id:	AZ7000000027800

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

204  
SW  
1/2 - 1 Mile  
Higher

AZ WELLS

AZ7000000027813

Program:	55	Registry i:	585097
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	161		
Approved:	1/23/2001 12:00:00 AM	Installed:	9/28/2001 12:00:00 AM
Well depth:	127		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018C00
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	Not Reported	Qacre40dir:	Not Reported
Quarter 10:	Not Reported	Qacre10dir:	Not Reported
Utm x mete:	504127.8		
Utm y mete:	3554082		
Applicatio:	1/9/2001 12:00:00 AM	Site id:	AZ7000000027813

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BR466**  
**WSW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000027827**

Program:	55	Registry i:	507259
Owner name:	TUCSON WATER		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	342		
Approved:	Not Reported	Installed:	6/28/1984 12:00:00 AM
Well depth:	144		
Water leve:	93		
Casing dep:	140		
Casing dia:	16		
Casing typ:	PLASTIC OR PVC		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR 1 - 5 HP		
Pumprate:	60		
Testedrate:	60		
Draw down:	2		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013DBD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	503220.8		
Utm y mete:	3554175		
Applicatio:	2/17/1984 12:00:00 AM	Site id:	AZ7000000027827

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BR467**  
**WSW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000027828**

Program:	55	Registry i:	507247
Owner name:	TUCSON WATER	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	342		
Approved:	Not Reported	Installed:	6/26/1984 12:00:00 AM
Well depth:	406		
Water leve:	208		
Casing dep:	400		
Casing dia:	16		
Casing typ:	PLASTIC OR PVC		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR 1 - 5 HP		
Pumprate:	44		
Testedrate:	44		
Draw down:	6		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013DBD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	503220.8		
Utm y mete:	3554175		
Applicatio:	2/17/1984 12:00:00 AM	Site id:	AZ7000000027828

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BG387**  
**WSW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS AZ7000000027829**

Program:	55	Registry i:	553141
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013013DAC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503422.4		
Utm y mete:	3554177		
Applicatio:	11/21/1995 12:00:00 AM	Site id:	AZ7000000027829



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BG386**  
**WSW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS** **AZ7000000027830**

Program:	55	Registry i:	553142
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013013DAC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503422.4		
Utm y mete:	3554177		
Applicatio:	11/21/1995 12:00:00 AM	Site id:	AZ7000000027830

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BG389**  
**WSW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS AZ7000000027831**

Program:	55	Registry i:	569350
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	52		
Approved:	7/13/1998 12:00:00 AM	Installed:	8/5/1998 12:00:00 AM
Well depth:	131		
Water leve:	120		
Casing dep:	131		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013DAC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503422.4		
Utm y mete:	3554177		
Applicatio:	6/22/1998 12:00:00 AM	Site id:	AZ7000000027831

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BG388**  
**WSW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS** **AZ7000000027832**

Program:	55	Registry i:	569351
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	52		
Approved:	7/13/1998 12:00:00 AM	Installed:	8/3/1998 12:00:00 AM
Well depth:	139		
Water leve:	110		
Casing dep:	138		
Casing dia:	10		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013DAC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503422.4		
Utm y mete:	3554177		
Applicatio:	6/22/1998 12:00:00 AM	Site id:	AZ7000000027832

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AS314**  
**SW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS AZ7000000027834**

Program:	55	Registry i:	569349
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	52		
Approved:	7/13/1998 12:00:00 AM	Installed:	7/30/1998 12:00:00 AM
Well depth:	150		
Water leve:	110		
Casing dep:	147		
Casing dia:	10		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013DAD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	503624		
Utm y mete:	3554179		
Applicatio:	6/22/1998 12:00:00 AM	Site id:	AZ7000000027834

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AS313**  
**SW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000027835**

Program:	55	Registry i:	593250
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	7		
Approved:	7/2/2002 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15013013DAD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	503624		
Utm y mete:	3554179		
Applicatio:	6/24/2002 12:00:00 AM	Site id:	AZ7000000027835

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AS316**  
**SW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000027836**

Program:	55	Registry i:	593249
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	7		
Approved:	7/2/2002 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15013013DAD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	503624		
Utm y mete:	3554179		
Applicatio:	6/24/2002 12:00:00 AM	Site id:	AZ7000000027836

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AS315**  
**SW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000027837**

Program:	55	Registry i:	913300
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013013DAD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	503624		
Utm y mete:	3554179		
Applicatio:	5/25/2011 9:08:25 AM	Site id:	AZ7000000027837

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AI253**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027838**

Program:	55	Registry i:	505565
Owner name:	TUCSON WATER		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	22		
Approved:	Not Reported	Installed:	12/7/1983 12:00:00 AM
Well depth:	362		
Water leve:	91		
Casing dep:	357		
Casing dia:	6		
Casing typ:	PLASTIC OR PVC		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR 1 - 5 HP		
Pumprate:	1		
Testedrate:	1		
Draw down:	27		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CBC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.7		
Utm y mete:	3554181		
Applicatio:	6/8/1983 12:00:00 AM	Site id:	AZ7000000027838



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AI254**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS** **AZ7000000027839**

Program:	55	Registry i:	505566
Owner name:	TUCSON WATER		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	22		
Approved:	Not Reported	Installed:	12/11/1983 12:00:00 AM
Well depth:	135		
Water leve:	232		
Casing dep:	128		
Casing dia:	6		
Casing typ:	PLASTIC OR PVC		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR 1 - 5 HP		
Pumprate:	16		
Testedrate:	16		
Draw down:	68		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CBC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.7		
Utm y mete:	3554181		
Applicatio:	6/8/1983 12:00:00 AM	Site id:	AZ7000000027839

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AI252**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027840**

Program:	55	Registry i:	548147
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	5/22/1995 12:00:00 AM
Well depth:	95		
Water leve:	92		
Casing dep:	47		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CBC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.7		
Utm y mete:	3554181		
Applicatio:	4/6/1995 12:00:00 AM	Site id:	AZ7000000027840

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AI250**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027841**

Program:	55	Registry i:	548221
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	6/2/1995 12:00:00 AM
Well depth:	181		
Water leve:	114		
Casing dep:	166		
Casing dia:	12		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CBC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.7		
Utm y mete:	3554181		
Applicatio:	3/14/1995 12:00:00 AM	Site id:	AZ7000000027841

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AI251**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027842**

Program:	55	Registry i:	548222
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	5/25/1995 12:00:00 AM
Well depth:	161		
Water leve:	112		
Casing dep:	146		
Casing dia:	12		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CBC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.7		
Utm y mete:	3554181		
Applicatio:	3/14/1995 12:00:00 AM	Site id:	AZ7000000027842

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AI255**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027843**

Program:	55	Registry i:	548232
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	4/27/1995 12:00:00 AM
Well depth:	104		
Water leve:	88		
Casing dep:	102		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CBC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.7		
Utm y mete:	3554181		
Applicatio:	3/14/1995 12:00:00 AM	Site id:	AZ7000000027843

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AI259**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027844**

Program:	55	Registry i:	593252
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	7		
Approved:	7/2/2002 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018CBC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.7		
Utm y mete:	3554181		
Applicatio:	6/24/2002 12:00:00 AM	Site id:	AZ7000000027844

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AI260**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027845**

Program:	55	Registry i:	593253
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	7		
Approved:	7/2/2002 12:00:00 AM	Installed:	10/30/2002 12:00:00 AM
Well depth:	130		
Water leve:	110		
Casing dep:	0		
Casing dia:	10		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CBC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.7		
Utm y mete:	3554181		
Applicatio:	6/24/2002 12:00:00 AM	Site id:	AZ7000000027845

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AI258**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027846**

Program:	55	Registry i:	593481
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	7/15/2002 12:00:00 AM	Installed:	10/16/2002 12:00:00 AM
Well depth:	171		
Water leve:	149		
Casing dep:	170		
Casing dia:	5		
Casing typ:	OTHER - BLACK STEEL - IRON - SEAMLESS		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CBC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.7		
Utm y mete:	3554181		
Applicatio:	7/8/2002 12:00:00 AM	Site id:	AZ7000000027846



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AI256**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS** **AZ7000000027847**

Program:	55	Registry i:	585098
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	161		
Approved:	3/23/2001 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018CBC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.7		
Utm y mete:	3554181		
Applicatio:	1/9/2001 12:00:00 AM	Site id:	AZ7000000027847

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AI257**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027848**

Program:	55	Registry i:	619963
Owner name:	TUCSON, CITY OF,		
Rgr pump d:	NO	Welltype:	NON-EXEMPT
Well type :	NON-EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	9/1/1942 12:00:00 AM
Well depth:	320		
Water leve:	0		
Casing dep:	320		
Casing dia:	16		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018CBC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.7		
Utm y mete:	3554181		
Applicatio:	6/9/1982 12:00:00 AM	Site id:	AZ7000000027848

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AA198**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027849**

Program:	55	Registry i:	548230
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	4/23/1995 12:00:00 AM
Well depth:	107		
Water leve:	92		
Casing dep:	105		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CBD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504027.3		
Utm y mete:	3554182		
Applicatio:	3/14/1995 12:00:00 AM	Site id:	AZ7000000027849

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AA199**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027850**

Program:	55	Registry i:	593184
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	7/30/2002 12:00:00 AM	Installed:	9/3/2002 12:00:00 AM
Well depth:	130		
Water leve:	91		
Casing dep:	130		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CBD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504027.3		
Utm y mete:	3554182		
Applicatio:	6/21/2002 12:00:00 AM	Site id:	AZ7000000027850

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**138**  
**South**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027855**

Program:	55	Registry i:	619931
Owner name:	TUCSON, CITY OF,		
Rgr pump d:	YES	Welltype:	NON-EXEMPT
Well type :	NON-EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	5/1/1944 12:00:00 AM
Well depth:	320		
Water leve:	0		
Casing dep:	320		
Casing dia:	14		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018DBD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504833.7		
Utm y mete:	3554188		
Applicatio:	6/9/1982 12:00:00 AM	Site id:	AZ7000000027855

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

184  
SE  
1/2 - 1 Mile  
Higher

AZ WELLS

AZ7000000027861

Program:	55	Registry i:	619932
Owner name:	TUCSON, CITY OF,		
Rgr pump d:	YES	Welltype:	NON-EXEMPT
Well type :	NON-EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014017CBC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505439.7		
Utm y mete:	3554192		
Applicatio:	6/9/1982 12:00:00 AM	Site id:	AZ7000000027861

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

487  
WSW  
1 - 2 Miles  
Lower

AZ WELLS

AZ7000000027876

Program:	55	Registry i:	636363
Owner name:	CARRANZA,R L		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	106		
Water leve:	0		
Casing dep:	106		
Casing dia:	4		
Casing typ:	OTHER - BLACK STEEL - IRON - SEAMLESS		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	5		
Testedrate:	5		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013013DB0
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	0	Qacre10dir:	Not Reported
Utm x mete:	503120		
Utm y mete:	3554276		
Applicatio:	6/14/1982 12:00:00 AM	Site id:	AZ7000000027876

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**Z182**  
**SE**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000027881**

Program:	55	Registry i:	600002
Owner name:	TUCSON AIRPORT,		
Rgr pump d:	NO	Welltype:	NON-EXEMPT
Well type :	NON-EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	1/1/1954 12:00:00 AM
Well depth:	0		
Water leve:	100		
Casing dep:	0		
Casing dia:	12		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	935		
Testedrate:	935		
Draw down:	0		
Completion:	N	Drill log:	N
Well cance:	Y	Cadastral:	D15014017CB0
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	0	Qacre10dir:	Not Reported
Utm x mete:	505541.7		
Utm y mete:	3554292		
Applicatio:	11/10/1981 12:00:00 AM	Site id:	AZ7000000027881



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

502  
WSW  
1 - 2 Miles  
Lower

AZ WELLS AZ7000000027900

Program:	55	Registry i:	562570
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	473		
Approved:	10/27/1997 12:00:00 AM	Installed:	11/11/1997 12:00:00 AM
Well depth:	101		
Water leve:	93		
Casing dep:	110		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013DBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.3		
Utm y mete:	3554376		
Applicatio:	5/12/1997 12:00:00 AM	Site id:	AZ7000000027900

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

284  
WSW  
1/2 - 1 Mile  
Lower

AZ WELLS

AZ7000000027903

Program:	55	Registry i:	593251
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	7		
Approved:	6/28/2002 12:00:00 AM	Installed:	1/7/2003 12:00:00 AM
Well depth:	120		
Water leve:	107		
Casing dep:	0		
Casing dia:	10		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013DAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503624		
Utm y mete:	3554382		
Applicatio:	6/24/2002 12:00:00 AM	Site id:	AZ7000000027903

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AG207**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS** **AZ7000000027904**

Program:	55	Registry i:	502081
Owner name:	AZ DEPT OF HEALTH,		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	263		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	175		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018CBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.5		
Utm y mete:	3554384		
Applicatio:	2/1/1982 12:00:00 AM	Site id:	AZ7000000027904

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AG206**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027905**

Program:	55	Registry i:	593257
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	7		
Approved:	7/2/2002 12:00:00 AM	Installed:	7/30/2002 12:00:00 AM
Well depth:	125		
Water leve:	0		
Casing dep:	0		
Casing dia:	10		
Casing typ:	NO CASING CODE LISTED		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.5		
Utm y mete:	3554384		
Applicatio:	6/24/2002 12:00:00 AM	Site id:	AZ7000000027905

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AG205**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027906**

Program:	55	Registry i:	911312
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	161		
Approved:	10/26/2009 7:05:31 AM	Installed:	11/4/2009 12:00:00 AM
Well depth:	120		
Water leve:	95		
Casing dep:	119		
Casing dia:	3		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.5		
Utm y mete:	3554384		
Applicatio:	10/26/2009 7:05:31 AM	Site id:	AZ7000000027906

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AG210**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027907**

Program:	55	Registry i:	911314
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	161		
Approved:	10/26/2009 7:13:09 AM	Installed:	11/20/2009 12:00:00 AM
Well depth:	102		
Water leve:	95		
Casing dep:	101		
Casing dia:	3		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.5		
Utm y mete:	3554384		
Applicatio:	10/26/2009 7:13:09 AM	Site id:	AZ7000000027907

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AG209**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027908**

Program:	55	Registry i:	911445
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	161		
Approved:	11/18/2009 4:46:06 PM	Installed:	11/25/2009 12:00:00 AM
Well depth:	115		
Water leve:	95		
Casing dep:	113		
Casing dia:	3		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.5		
Utm y mete:	3554384		
Applicatio:	11/18/2009 4:46:06 PM	Site id:	AZ7000000027908

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AG208**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027909**

Program:	55	Registry i:	911491
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	161		
Approved:	12/1/2009 4:43:33 PM	Installed:	Not Reported
Well depth:	115		
Water leve:	95		
Casing dep:	98		
Casing dia:	3		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.5		
Utm y mete:	3554384		
Applicatio:	12/1/2009 4:43:33 PM	Site id:	AZ7000000027909



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**X157**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027910**

Program:	55	Registry i:	562568
Owner name:	TUCSON AIRPORT AUTH,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	6/12/1997 12:00:00 AM
Well depth:	102		
Water leve:	87		
Casing dep:	101		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018CBA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027.2		
Utm y mete:	3554385		
Applicatio:	5/12/1997 12:00:00 AM	Site id:	AZ7000000027910

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**X158**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027911**

Program:	55	Registry i:	619962
Owner name:	TUCSON, CITY OF,		
Rgr pump d:	NO	Welltype:	NON-EXEMPT
Well type :	NON-EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	10/1/1941 12:00:00 AM
Well depth:	244		
Water leve:	0		
Casing dep:	244		
Casing dia:	12		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018CBA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027.2		
Utm y mete:	3554385		
Applicatio:	6/9/1982 12:00:00 AM	Site id:	AZ7000000027911

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

531  
ESE  
1 - 2 Miles  
Higher

AZ WELLS

AZ7000000027915

Program: 55  
Owner name: IBM CORP,  
Rgr pump d: NO  
Well type : OTHER  
Dlic num: 25  
Approved: Not Reported  
Well depth: 145  
Water leve: 110  
Casing dep: 100  
Casing dia: 8  
Casing typ: PLASTIC OR PVC  
Pump type: SUBMERSIBLE  
Pump power: ELECTRIC MOTOR < 1 HP  
Pumprate: 14  
Testedrate: 14  
Draw down: 30  
Completion: X  
Well cance: Y  
County: PIMA  
Basin name: TUCSON AMA  
Ama: TUCSON  
Whole town: 15  
Half towns: 0  
Northsouth: S  
Whole rang: 14  
Half range: 0  
Eastwest: E  
Section: 17  
Quarter 16: D  
Quarter 40: A  
Quarter 10: B  
Utm x mete: 506666.5  
Utm y mete: 3554391  
Applicatio: 10/27/1983 12:00:00 AM

Registry i: 506568  
Welltype: EXPLORATION  
Installed: 11/24/1983 12:00:00 AM

Drill log: X  
Cadastral: D15014017DAB  
Watershed: SANTA CRUZ RIVER  
Subbasin n: UPPER SANTA CRUZ  
Quad code: D

Qacre160di: SE  
Qacre40dir: NE  
Qacre10dir: NW

Site id: AZ7000000027915

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

481  
ESE  
1 - 2 Miles  
Higher

AZ WELLS

AZ7000000027916

Program: 55  
Owner name: IBM CORP,  
Rgr pump d: NO  
Well type : OTHER  
Dlic num: 25  
Approved: Not Reported  
Well depth: 150  
Water leve: 107  
Casing dep: 98  
Casing dia: 8  
Casing typ: PLASTIC OR PVC  
Pump type: SUBMERSIBLE  
Pump power: ELECTRIC MOTOR < 1 HP  
Pumprate: 14  
Testedrate: 14  
Draw down: 5  
Completion: X  
Well cance: Y  
County: PIMA  
Basin name: TUCSON AMA  
Ama: TUCSON  
Whole town: 15  
Half towns: 0  
Northsouth: S  
Whole rang: 14  
Half range: 0  
Eastwest: E  
Section: 17  
Quarter 16: D  
Quarter 40: B  
Quarter 10: A  
Utm x mete: 506461.9  
Utm y mete: 3554391  
Applicatio: 10/27/1983 12:00:00 AM

Registry i: 506569  
Welltype: EXPLORATION  
Installed: 11/24/1983 12:00:00 AM  
Drill log: X  
Cadastral: D15014017DBA  
Watershed: SANTA CRUZ RIVER  
Subbasin n: UPPER SANTA CRUZ  
Quad code: D  
Qacre160di: SE  
Qacre40dir: NW  
Qacre10dir: NE  
Site id: AZ7000000027916

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AV319**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027922**

Program:	55	Registry i:	531669
Owner name:	ALAMO RENT-A-CAR, INC.		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	533		
Approved:	Not Reported	Installed:	5/17/1991 12:00:00 AM
Well depth:	125		
Water leve:	105		
Casing dep:	0		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	A	Drill log:	X
Well cance:	Y	Cadastral:	D15014017CAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	506052.8		
Utm y mete:	3554392		
Applicatio:	4/25/1991 12:00:00 AM	Site id:	AZ7000000027922

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AV318**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000027923**

Program:	55	Registry i:	531670
Owner name:	ALAMO RENT-A-CAR, INC.		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	533		
Approved:	Not Reported	Installed:	2/20/1992 12:00:00 AM
Well depth:	120		
Water leve:	105		
Casing dep:	120		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	A	Drill log:	X
Well cance:	Y	Cadastral:	D15014017CAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	506052.8		
Utm y mete:	3554392		
Applicatio:	4/22/1991 12:00:00 AM	Site id:	AZ7000000027923

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AV317**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027924**

Program:	55	Registry i:	531671
Owner name:	ALAMO RENT-A-CAR, INC.		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	533		
Approved:	Not Reported	Installed:	2/20/1992 12:00:00 AM
Well depth:	120		
Water leve:	105		
Casing dep:	120		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	A	Drill log:	X
Well cance:	Y	Cadastral:	D15014017CAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	506052.8		
Utm y mete:	3554392		
Applicatio:	4/22/1991 12:00:00 AM	Site id:	AZ7000000027924

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AV320**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027925**

Program:	55	Registry i:	534401
Owner name:	ALAMO RENT-A-CAR, INC.		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	533		
Approved:	Not Reported	Installed:	2/20/1992 12:00:00 AM
Well depth:	120		
Water leve:	105		
Casing dep:	118		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	A	Drill log:	X
Well cance:	Y	Cadastral:	D15014017CAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	506052.8		
Utm y mete:	3554392		
Applicatio:	2/4/1992 12:00:00 AM	Site id:	AZ7000000027925



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AV323**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027926**

Program:	55	Registry i:	537921
Owner name:	ALAMO RENT-A-CAR, INC.		
Rgr pump d:	NO	Welltype:	PIEZOMETER
Well type :	MONITOR		
Dlic num:	533		
Approved:	Not Reported	Installed:	1/28/1993 12:00:00 AM
Well depth:	119		
Water leve:	108		
Casing dep:	78		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	A	Drill log:	X
Well cance:	Y	Cadastral:	D15014017CAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	506052.8		
Utm y mete:	3554392		
Applicatio:	10/9/1993 12:00:00 AM	Site id:	AZ7000000027926

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AV322**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027927**

Program:	55	Registry i:	628865
Owner name:	NZ PROPERTIES INC,	Welltype:	NON-EXEMPT
Rgr pump d:	NO		
Well type :	NON-EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014017CAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	506052.8		
Utm y mete:	3554392		
Applicatio:	6/16/1982 12:00:00 AM	Site id:	AZ7000000027927

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AV321**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027928**

Program:	55	Registry i:	806271
Owner name:	DFK INVESTMENTS,		
Rgr pump d:	NO	Welltype:	NON-EXEMPT
Well type :	NON-EXEMPT		
Dlic num:	473		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014017CAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	506052.8		
Utm y mete:	3554392		
Applicatio:	2/19/1992 12:00:00 AM	Site id:	AZ7000000027928

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

148  
SE  
1/2 - 1 Mile  
Higher

AZ WELLS AZ7000000027932

Program:	55	Registry i:	564516
Owner name:	US EPA REGION 9,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	529		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014017CBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505439		
Utm y mete:	3554393		
Applicatio:	9/8/1997 12:00:00 AM	Site id:	AZ7000000027932

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

Q128

SE  
1/4 - 1/2 Mile  
Higher

AZ WELLS AZ7000000027933

Program:	55	Registry i:	548219
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	4/6/1995 12:00:00 AM
Well depth:	110		
Water leve:	93		
Casing dep:	0		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018DAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	505236.1		
Utm y mete:	3554393		
Applicatio:	3/14/1995 12:00:00 AM	Site id:	AZ7000000027933

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**Q129**  
**SE**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000027934**

Program:	55	Registry i:	549881
Owner name:	TUCSON AIRPORT,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018DAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	505236.1		
Utm y mete:	3554393		
Applicatio:	5/26/1995 12:00:00 AM	Site id:	AZ7000000027934

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**CB513**  
**WSW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000027955**

Program:	55	Registry i:	540975
Owner name:	TUCSON, CITY OF,		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	473		
Approved:	Not Reported	Installed:	11/24/1993 12:00:00 AM
Well depth:	165		
Water leve:	0		
Casing dep:	0		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	1		
Testedrate:	1		
Draw down:	0		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013000
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	0	Qacre160di:	Not Reported
Quarter 40:	0	Qacre40dir:	Not Reported
Quarter 10:	0	Qacre10dir:	Not Reported
Utm x mete:	502918.7		
Utm y mete:	3554477		
Applicatio:	10/15/1993 12:00:00 AM	Site id:	AZ7000000027955

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**CB512**  
**WSW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000027956**

Program:	55	Registry i:	642828
Owner name:	NORIEGA,L		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	185		
Water leve:	110		
Casing dep:	0		
Casing dia:	6		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	15		
Testedrate:	15		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013013000
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	0	Qacre160di:	Not Reported
Quarter 40:	0	Qacre40dir:	Not Reported
Quarter 10:	0	Qacre10dir:	Not Reported
Utm x mete:	502918.7		
Utm y mete:	3554477		
Applicatio:	6/18/1982 12:00:00 AM	Site id:	AZ7000000027956



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**CB515**  
**WSW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000027957**

Program:	55	Registry i:	805845
Owner name:	DEISLER, RAMONA,	Welltype:	EXEMPT
Rgr pump d:	NO		
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	12/31/1979 12:00:00 AM
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013013000
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	0	Qacre160di:	Not Reported
Quarter 40:	0	Qacre40dir:	Not Reported
Quarter 10:	0	Qacre10dir:	Not Reported
Utm x mete:	502918.7		
Utm y mete:	3554477		
Applicatio:	8/27/1990 12:00:00 AM	Site id:	AZ7000000027957

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**CB514**  
**WSW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000027958**

Program:	55	Registry i:	913085
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	83		
Approved:	3/24/2011 9:50:12 PM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013013000
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	0	Qacre160di:	Not Reported
Quarter 40:	0	Qacre40dir:	Not Reported
Quarter 10:	0	Qacre10dir:	Not Reported
Utm x mete:	502918.7		
Utm y mete:	3554477		
Applicatio:	3/24/2011 9:50:12 PM	Site id:	AZ7000000027958

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**O117**  
**SSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027959**

Program:	55	Registry i:	540974
Owner name:	TUCSON AIRPORT,	Welltype:	EXPLORATION
Rgr pump d:	NO		
Well type :	OTHER		
Dlic num:	473		
Approved:	Not Reported	Installed:	11/6/1993 12:00:00 AM
Well depth:	100		
Water leve:	0		
Casing dep:	0		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	1		
Testedrate:	1		
Draw down:	0		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018000
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	0	Qacre160di:	Not Reported
Quarter 40:	0	Qacre40dir:	Not Reported
Quarter 10:	0	Qacre10dir:	Not Reported
Utm x mete:	504529.4		
Utm y mete:	3554489		
Applicatio:	10/15/1993 12:00:00 AM	Site id:	AZ7000000027959

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**O116**  
**SSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000027960**

Program:	55	Registry i:	911315
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	161		
Approved:	10/26/2009 7:19:41 AM	Installed:	11/20/2009 12:00:00 AM
Well depth:	115		
Water leve:	0		
Casing dep:	0		
Casing dia:	8		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	A	Drill log:	X
Well cance:	Y	Cadastral:	D15014018000
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	0	Qacre160di:	Not Reported
Quarter 40:	0	Qacre40dir:	Not Reported
Quarter 10:	0	Qacre10dir:	Not Reported
Utm x mete:	504529.4		
Utm y mete:	3554489		
Applicatio:	10/26/2009 7:19:41 AM	Site id:	AZ7000000027960

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**O119**  
**SSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000027961**

Program:	55	Registry i:	913086
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	83		
Approved:	3/24/2011 9:56:25 PM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018000
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	0	Qacre160di:	Not Reported
Quarter 40:	0	Qacre40dir:	Not Reported
Quarter 10:	0	Qacre10dir:	Not Reported
Utm x mete:	504529.4		
Utm y mete:	3554489		
Applicatio:	3/24/2011 9:56:25 PM	Site id:	AZ7000000027961

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**O118**  
**SSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000027962**

Program:	55	Registry i:	914171
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	83		
Approved:	3/24/2012 3:05:57 PM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018000
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	0	Qacre160di:	Not Reported
Quarter 40:	0	Qacre40dir:	Not Reported
Quarter 10:	0	Qacre10dir:	Not Reported
Utm x mete:	504529.4		
Utm y mete:	3554489		
Applicatio:	3/24/2012 3:05:57 PM	Site id:	AZ7000000027962

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**CF533**  
**WSW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000027992**

Program:	55	Registry i:	507250
Owner name:	TUCSON WATER		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	342		
Approved:	Not Reported	Installed:	6/23/1984 12:00:00 AM
Well depth:	145		
Water leve:	92		
Casing dep:	130		
Casing dia:	16		
Casing typ:	PLASTIC OR PVC		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR 1 - 5 HP		
Pumprate:	40		
Testedrate:	40		
Draw down:	24		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013BDD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	502817.8		
Utm y mete:	3554577		
Applicatio:	2/17/1984 12:00:00 AM	Site id:	AZ7000000027992

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**CF534**  
**WSW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000027993**

Program:	55	Registry i:	807396
Owner name:	RAFAEL & MARIA L GONZALEZ		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	11/30/1946 12:00:00 AM
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	6		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013013BDD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	502817.8		
Utm y mete:	3554577		
Applicatio:	11/1/1996 12:00:00 AM	Site id:	AZ7000000027993



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

312  
WSW  
1/2 - 1 Mile  
Lower

AZ WELLS AZ7000000027994

Program:	55	Registry i:	400147
Owner name:	PIMA COUNTY		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	7		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	A	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15013013ADC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503422.5		
Utm y mete:	3554583		
Applicatio:	11/15/1999 12:00:00 AM	Site id:	AZ7000000027994

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AM242**  
**WSW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS** **AZ7000000027995**

Program:	55	Registry i:	209878
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013013ADD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	503624		
Utm y mete:	3554585		
Applicatio:	10/24/2005 12:00:00 AM	Site id:	AZ7000000027995

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AM241**  
**WSW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS** **AZ7000000027996**

Program:	55	Registry i:	209880
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013013ADD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	503624		
Utm y mete:	3554585		
Applicatio:	10/24/2005 12:00:00 AM	Site id:	AZ7000000027996

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AM240**  
**WSW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000027997**

Program:	55	Registry i:	522253
Owner name:	SOUTHWEST GAS CORP,		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	499		
Approved:	Not Reported	Installed:	10/29/1988 12:00:00 AM
Well depth:	228		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ADD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	503624		
Utm y mete:	3554585		
Applicatio:	9/9/1988 12:00:00 AM	Site id:	AZ7000000027997

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AM245**  
**WSW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS** **AZ7000000027998**

Program:	55	Registry i:	593247
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	7		
Approved:	6/28/2002 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15013013ADD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	503624		
Utm y mete:	3554585		
Applicatio:	6/24/2002 12:00:00 AM	Site id:	AZ7000000027998

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AM244**  
**WSW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000027999**

Program:	55	Registry i:	593248
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	7		
Approved:	6/28/2002 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15013013ADD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	503624		
Utm y mete:	3554585		
Applicatio:	6/24/2002 12:00:00 AM	Site id:	AZ7000000027999

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AM243**  
**WSW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028000**

Program:	55	Registry i:	634143
Owner name:	RIES,D M		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	142		
Water leve:	0		
Casing dep:	0		
Casing dia:	6		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	13		
Testedrate:	13		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013013ADD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	503624		
Utm y mete:	3554585		
Applicatio:	5/25/1982 12:00:00 AM	Site id:	AZ7000000028000

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**Y168**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028001**

Program:	55	Registry i:	206902
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	161		
Approved:	3/4/2005 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.4		
Utm y mete:	3554587		
Applicatio:	3/2/2005 12:00:00 AM	Site id:	AZ7000000028001



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**Y167**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028002**

Program:	55	Registry i:	206903
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	161		
Approved:	3/4/2005 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.4		
Utm y mete:	3554587		
Applicatio:	3/2/2005 12:00:00 AM	Site id:	AZ7000000028002

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**Y169**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028003**

Program:	55	Registry i:	206904
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	161		
Approved:	3/4/2005 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.4		
Utm y mete:	3554587		
Applicatio:	3/2/2005 12:00:00 AM	Site id:	AZ7000000028003

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

Y171  
WSW  
1/2 - 1 Mile  
Higher

AZ WELLS AZ7000000028004

Program:	55	Registry i:	206905
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	161		
Approved:	3/4/2005 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.4		
Utm y mete:	3554587		
Applicatio:	3/2/2005 12:00:00 AM	Site id:	AZ7000000028004

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**Y170**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028005**

Program:	55	Registry i:	206906
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	161		
Approved:	3/4/2005 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.4		
Utm y mete:	3554587		
Applicatio:	3/2/2005 12:00:00 AM	Site id:	AZ7000000028005

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**Y163**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028006**

Program:	55	Registry i:	206907
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	161		
Approved:	3/4/2005 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.4		
Utm y mete:	3554587		
Applicatio:	3/2/2005 12:00:00 AM	Site id:	AZ7000000028006

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**Y162**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028007**

Program:	55	Registry i:	206908
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	161		
Approved:	3/4/2005 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.4		
Utm y mete:	3554587		
Applicatio:	3/2/2005 12:00:00 AM	Site id:	AZ7000000028007

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**Y164**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028008**

Program:	55	Registry i:	206963
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	161		
Approved:	3/9/2005 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.4		
Utm y mete:	3554587		
Applicatio:	3/2/2005 12:00:00 AM	Site id:	AZ7000000028008

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**Y166**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028009**

Program:	55	Registry i:	206964
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	161		
Approved:	3/9/2005 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.4		
Utm y mete:	3554587		
Applicatio:	3/2/2005 12:00:00 AM	Site id:	AZ7000000028009



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**Y165**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028010**

Program:	55	Registry i:	206965
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	161		
Approved:	3/9/2005 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.4		
Utm y mete:	3554587		
Applicatio:	3/2/2005 12:00:00 AM	Site id:	AZ7000000028010

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**Y178**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028011**

Program:	55	Registry i:	206966
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	161		
Approved:	3/9/2005 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.4		
Utm y mete:	3554587		
Applicatio:	3/2/2005 12:00:00 AM	Site id:	AZ7000000028011

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

Y177  
WSW  
1/2 - 1 Mile  
Higher

AZ WELLS AZ7000000028012

Program:	55	Registry i:	206967
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	161		
Approved:	3/9/2005 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.4		
Utm y mete:	3554587		
Applicatio:	3/2/2005 12:00:00 AM	Site id:	AZ7000000028012

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**Y179**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028013**

Program:	55	Registry i:	206968
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	161		
Approved:	3/9/2005 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.4		
Utm y mete:	3554587		
Applicatio:	3/2/2005 12:00:00 AM	Site id:	AZ7000000028013

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**Y181**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028014**

Program:	55	Registry i:	206969
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	161		
Approved:	3/9/2005 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.4		
Utm y mete:	3554587		
Applicatio:	3/2/2005 12:00:00 AM	Site id:	AZ7000000028014

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**Y180**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028015**

Program:	55	Registry i:	206970
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	161		
Approved:	3/9/2005 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.4		
Utm y mete:	3554587		
Applicatio:	3/2/2005 12:00:00 AM	Site id:	AZ7000000028015

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

Y173  
WSW  
1/2 - 1 Mile  
Higher

AZ WELLS

AZ7000000028016

Program:	55	Registry i:	562565
Owner name:	TUCSON AIRPORT AUTH,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	6/28/1997 12:00:00 AM
Well depth:	101		
Water leve:	87		
Casing dep:	97		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.4		
Utm y mete:	3554587		
Applicatio:	5/12/1997 12:00:00 AM	Site id:	AZ7000000028016

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

Y172  
WSW  
1/2 - 1 Mile  
Higher

AZ WELLS AZ7000000028017

Program:	55	Registry i:	562566
Owner name:	TUCSON AIRPORT AUTH,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	6/11/1997 12:00:00 AM
Well depth:	101		
Water leve:	87		
Casing dep:	97		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.4		
Utm y mete:	3554587		
Applicatio:	5/12/1997 12:00:00 AM	Site id:	AZ7000000028017



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**Y174**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028018**

Program:	55	Registry i:	593254
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	7		
Approved:	7/2/2002 12:00:00 AM	Installed:	8/7/2002 12:00:00 AM
Well depth:	128		
Water leve:	90		
Casing dep:	0		
Casing dia:	10		
Casing typ:	NO CASING CODE LISTED		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.4		
Utm y mete:	3554587		
Applicatio:	6/24/2002 12:00:00 AM	Site id:	AZ7000000028018

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**Y176**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028019**

Program:	55	Registry i:	593185
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	6/25/2002 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.4		
Utm y mete:	3554587		
Applicatio:	6/21/2002 12:00:00 AM	Site id:	AZ7000000028019

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**Y175**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028020**

Program:	55	Registry i:	593186
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	7		
Approved:	6/25/2002 12:00:00 AM	Installed:	10/18/2002 12:00:00 AM
Well depth:	130		
Water leve:	108		
Casing dep:	125		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.4		
Utm y mete:	3554587		
Applicatio:	6/21/2002 12:00:00 AM	Site id:	AZ7000000028020

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**142**  
**WSW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028022**

Program:	55	Registry i:	562567
Owner name:	TUCSON AIRPORT AUTH,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	6/14/1997 12:00:00 AM
Well depth:	100		
Water leve:	87		
Casing dep:	95		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BCD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504027		
Utm y mete:	3554588		
Applicatio:	5/12/1997 12:00:00 AM	Site id:	AZ7000000028022

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**CC516**  
**ESE**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS** **AZ7000000028027**

Program:	55	Registry i:	623395
Owner name:	MATTHEW ROHASEK		
Rgr pump d:	NO	Welltype:	NON-EXEMPT
Well type :	NON-EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	7/1/1970 12:00:00 AM
Well depth:	458		
Water leve:	0		
Casing dep:	45		
Casing dia:	10		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	200		
Testedrate:	200		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014017ADC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	506665.7		
Utm y mete:	3554593		
Applicatio:	6/11/1982 12:00:00 AM	Site id:	AZ7000000028027

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**CC517**  
**ESE**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS**

**AZ7000000028028**

Program:	55	Registry i:	623396
Owner name:	MATTHEW ROHASEK		
Rgr pump d:	NO	Welltype:	NON-EXEMPT
Well type :	NON-EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	9/1/1973 12:00:00 AM
Well depth:	1125		
Water leve:	128		
Casing dep:	1125		
Casing dia:	16		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	250		
Testedrate:	250		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014017ADC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	506665.7		
Utm y mete:	3554593		
Applicatio:	6/11/1982 12:00:00 AM	Site id:	AZ7000000028028

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**K98**  
**South**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028029**

Program:	55	Registry i:	523744
Owner name:	AZ ANG,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	5/16/1989 12:00:00 AM
Well depth:	123		
Water leve:	0		
Casing dep:	123		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ACD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504832.9		
Utm y mete:	3554592		
Applicatio:	3/22/1989 12:00:00 AM	Site id:	AZ7000000028029

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**K97**  
**South**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028030**

Program:	55	Registry i:	523751
Owner name:	AZ ANG,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018ACD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504832.9		
Utm y mete:	3554592		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028030



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**K96**  
**South**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028031**

Program:	55	Registry i:	523752
Owner name:	AZ ANG,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	5/13/1989 12:00:00 AM
Well depth:	148		
Water leve:	0		
Casing dep:	145		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ACD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504832.9		
Utm y mete:	3554592		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028031

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**K101**  
**South**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028032**

Program:	55	Registry i:	523753
Owner name:	AZ ANG,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	5/17/1989 12:00:00 AM
Well depth:	98		
Water leve:	0		
Casing dep:	98		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ACD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504832.9		
Utm y mete:	3554592		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028032

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**K100**  
**South**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028033**

Program:	55	Registry i:	525129
Owner name:	AZ AIR NATL GUARD,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	314	Installed:	9/30/1989 12:00:00 AM
Approved:	Not Reported		
Well depth:	143		
Water leve:	90		
Casing dep:	133		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ACD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504832.9		
Utm y mete:	3554592		
Applicatio:	6/12/1989 12:00:00 AM	Site id:	AZ7000000028033

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**K99**  
**South**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028034**

Program:	55	Registry i:	525130
Owner name:	AZ AIR NATL GUARD,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	9/27/1989 12:00:00 AM
Well depth:	148		
Water leve:	92		
Casing dep:	97		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ACD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504832.9		
Utm y mete:	3554592		
Applicatio:	6/12/1989 12:00:00 AM	Site id:	AZ7000000028034

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

349  
ESE  
1/2 - 1 Mile  
Higher

AZ WELLS

AZ7000000028036

Program:	55	Registry i:	519883
Owner name:	WEST-CAP ARIZONA CO,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	2/9/1988 12:00:00 AM
Well depth:	150		
Water leve:	95		
Casing dep:	150		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	C	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017ACC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	506256.7		
Utm y mete:	3554594		
Applicatio:	1/4/1988 12:00:00 AM	Site id:	AZ7000000028036

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

289  
ESE  
1/2 - 1 Mile  
Higher

AZ WELLS AZ7000000028037

Program:	55	Registry i:	531433
Owner name:	TRIPP, SCOTT, ETAL,		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	533		
Approved:	Not Reported	Installed:	3/29/1991 12:00:00 AM
Well depth:	136		
Water leve:	111		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Y	Cadastral:	D15014017BDD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	506052.2		
Utm y mete:	3554594		
Applicatio:	3/29/1991 12:00:00 AM	Site id:	AZ7000000028037

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AJ220**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028038**

Program:	55	Registry i:	202800
Owner name:	US ENVIRONMENTAL PROTECTION AGENCY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	498		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	135		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014017BDC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505847.7		
Utm y mete:	3554594		
Applicatio:	3/15/2004 12:00:00 AM	Site id:	AZ7000000028038

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

AJ219  
ESE  
1/2 - 1 Mile  
Higher

AZ WELLS AZ7000000028039

Program:	55	Registry i:	213364
Owner name:	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY/SUPERFUND DIV		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014017BDC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505847.7		
Utm y mete:	3554594		
Applicatio:	8/22/2006 12:00:00 AM	Site id:	AZ7000000028039



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AJ222**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028040**

Program:	55	Registry i:	218638
Owner name:	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY/SUPERFUND DIV		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	161		
Approved:	12/29/2008 12:00:00 AM	Installed:	12/17/2008 12:00:00 AM
Well depth:	135		
Water leve:	105		
Casing dep:	130		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BDC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505847.7		
Utm y mete:	3554594		
Applicatio:	12/15/2008 12:00:00 AM	Site id:	AZ7000000028040

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AJ221**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028041**

Program:	55	Registry i:	218639
Owner name:	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY/SUPERFUND DIV		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	161		
Approved:	12/29/2008 12:00:00 AM	Installed:	12/20/2008 12:00:00 AM
Well depth:	121		
Water leve:	90		
Casing dep:	120		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BDC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505847.7		
Utm y mete:	3554594		
Applicatio:	12/15/2008 12:00:00 AM	Site id:	AZ7000000028041

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AJ218**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028042**

Program:	55	Registry i:	218640
Owner name:	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY/SUPERFUND DIV		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	161		
Approved:	12/29/2008 12:00:00 AM	Installed:	1/9/2009 12:00:00 AM
Well depth:	131		
Water leve:	100		
Casing dep:	129		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BDC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505847.7		
Utm y mete:	3554594		
Applicatio:	12/15/2008 12:00:00 AM	Site id:	AZ7000000028042

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AJ215**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028043**

Program:	55	Registry i:	218641
Owner name:	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY/SUPERFUND DIV		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	161		
Approved:	12/29/2008 12:00:00 AM	Installed:	1/12/2009 12:00:00 AM
Well depth:	121		
Water leve:	90		
Casing dep:	120		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BDC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505847.7		
Utm y mete:	3554594		
Applicatio:	12/15/2008 12:00:00 AM	Site id:	AZ7000000028043

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AJ214**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028044**

Program:	55	Registry i:	218642
Owner name:	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY/SUPERFUND DIV		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	161		
Approved:	12/29/2008 12:00:00 AM	Installed:	1/3/2009 12:00:00 AM
Well depth:	121		
Water leve:	105		
Casing dep:	120		
Casing dia:	0		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BDC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505847.7		
Utm y mete:	3554594		
Applicatio:	12/15/2008 12:00:00 AM	Site id:	AZ7000000028044

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AJ217**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028045**

Program:	55	Registry i:	218643
Owner name:	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY/SUPERFUND DIV		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	161		
Approved:	12/29/2008 12:00:00 AM	Installed:	12/30/2008 12:00:00 AM
Well depth:	132		
Water leve:	105		
Casing dep:	129		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BDC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505847.7		
Utm y mete:	3554594		
Applicatio:	12/15/2008 12:00:00 AM	Site id:	AZ7000000028045

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AJ216**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028046**

Program:	55	Registry i:	507267
Owner name:	TUCSON WATER		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	342		
Approved:	Not Reported	Installed:	7/3/1984 12:00:00 AM
Well depth:	195		
Water leve:	99		
Casing dep:	190		
Casing dia:	6		
Casing typ:	PLASTIC OR PVC		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR 1 - 5 HP		
Pumprate:	46		
Testedrate:	46		
Draw down:	22		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BDC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505847.7		
Utm y mete:	3554594		
Applicatio:	2/17/1984 12:00:00 AM	Site id:	AZ7000000028046

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AJ223**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028047**

Program:	55	Registry i:	522252
Owner name:	SOUTHWEST GAS CORP,		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	499		
Approved:	Not Reported	Installed:	10/28/1988 12:00:00 AM
Well depth:	228		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BDC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505847.7		
Utm y mete:	3554594		
Applicatio:	9/9/1988 12:00:00 AM	Site id:	AZ7000000028047



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AJ230**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028048**

Program:	55	Registry i:	562968
Owner name:	US EPA REGION 9,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	529	Installed:	8/13/1997 12:00:00 AM
Approved:	Not Reported		
Well depth:	121		
Water leve:	103		
Casing dep:	120		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BDC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505847.7		
Utm y mete:	3554594		
Applicatio:	7/15/1997 12:00:00 AM	Site id:	AZ7000000028048

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AJ229**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS** **AZ7000000028049**

Program:	55	Registry i:	568653
Owner name:	ENVIRONMENTAL PROTECTION AGENCY		
Rgr pump d:	YES	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	620		
Approved:	Not Reported	Installed:	6/19/1998 12:00:00 AM
Well depth:	135		
Water leve:	105		
Casing dep:	125		
Casing dia:	6		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BDC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505847.7		
Utm y mete:	3554594		
Applicatio:	5/20/1998 12:00:00 AM	Site id:	AZ7000000028049

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AJ232**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028050**

Program:	55	Registry i:	568654
Owner name:	ENVIRONMENTAL PROTECTION AGENCY		
Rgr pump d:	YES	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	620		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014017BDC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505847.7		
Utm y mete:	3554594		
Applicatio:	5/20/1998 12:00:00 AM	Site id:	AZ7000000028050

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AJ231**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS** **AZ7000000028051**

Program:	55	Registry i:	568655
Owner name:	ENVIRONMENTAL PROTECTION AGENCY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	611		
Approved:	Not Reported	Installed:	7/2/1998 12:00:00 AM
Well depth:	121		
Water leve:	100		
Casing dep:	101		
Casing dia:	6		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	A	Drill log:	X
Well cance:	Y	Cadastral:	D15014017BDC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505847.7		
Utm y mete:	3554594		
Applicatio:	5/20/1998 12:00:00 AM	Site id:	AZ7000000028051

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AJ228**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028052**

Program:	55	Registry i:	568656
Owner name:	ENVIRONMENTAL PROTECTION AGENCY		
Rgr pump d:	YES	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	620		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014017BDC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505847.7		
Utm y mete:	3554594		
Applicatio:	5/20/1998 12:00:00 AM	Site id:	AZ7000000028052

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AJ225**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028053**

Program:	55	Registry i:	568657
Owner name:	ENVIRONMENTAL PROTECTION AGENCY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	620		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014017BDC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505847.7		
Utm y mete:	3554594		
Applicatio:	5/20/1998 12:00:00 AM	Site id:	AZ7000000028053

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AJ224**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028054**

Program:	55	Registry i:	568658
Owner name:	ENVIRONMENTAL PROTECTION AGENCY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014017BDC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505847.7		
Utm y mete:	3554594		
Applicatio:	5/20/1998 12:00:00 AM	Site id:	AZ7000000028054

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AJ227**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028055**

Program:	55	Registry i:	572012
Owner name:	US EPA REGION 9	Welltype:	MONITOR
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	611	Installed:	Not Reported
Approved:	12/3/1998 12:00:00 AM		
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014017BDC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505847.7		
Utm y mete:	3554594		
Applicatio:	4/11/2000 12:00:00 AM	Site id:	AZ7000000028055



## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AJ226**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028056**

Program:	55	Registry i:	910475
Owner name:	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	161		
Approved:	2/26/2009 4:32:25 PM	Installed:	1/29/2009 12:00:00 AM
Well depth:	110		
Water leve:	105		
Casing dep:	110		
Casing dia:	0		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BDC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505847.7		
Utm y mete:	3554594		
Applicatio:	2/26/2009 4:32:25 PM	Site id:	AZ7000000028056

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**W154**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028057**

Program:	55	Registry i:	202798
Owner name:	US ENVIRONMENTAL PROTECTION AGENCY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014017BCD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	505643.2		
Utm y mete:	3554594		
Applicatio:	3/15/2004 12:00:00 AM	Site id:	AZ7000000028057

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**W153**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028058**

Program:	55	Registry i:	213365
Owner name:	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY/SUPERFUND DIV		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014017BCD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	505643.2		
Utm y mete:	3554594		
Applicatio:	8/22/2006 12:00:00 AM	Site id:	AZ7000000028058

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**W156**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028059**

Program:	55	Registry i:	562969
Owner name:	US EPA REGION 9,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	529	Installed:	8/18/1997 12:00:00 AM
Approved:	Not Reported		
Well depth:	121		
Water leve:	105		
Casing dep:	120		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BCD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	505643.2		
Utm y mete:	3554594		
Applicatio:	7/15/1997 12:00:00 AM	Site id:	AZ7000000028059

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**W155**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028060**

Program:	55	Registry i:	620326
Owner name:	TUCSON, CITY OF,		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	66		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014017BCD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	505643.2		
Utm y mete:	3554594		
Applicatio:	6/9/1982 12:00:00 AM	Site id:	AZ7000000028060

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**R131**  
**ESE**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028061**

Program:	55	Registry i:	562967
Owner name:	US EPA REGION 9,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	529		
Approved:	Not Reported	Installed:	8/6/1997 12:00:00 AM
Well depth:	171		
Water leve:	97		
Casing dep:	145		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505438.2		
Utm y mete:	3554595		
Applicatio:	7/15/1997 12:00:00 AM	Site id:	AZ7000000028061

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**R130**  
**ESE**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028062**

Program:	55	Registry i:	562970
Owner name:	US EPA REGION 9,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	529		
Approved:	Not Reported	Installed:	8/27/1997 12:00:00 AM
Well depth:	117		
Water leve:	97		
Casing dep:	116		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505438.2		
Utm y mete:	3554595		
Applicatio:	7/15/1997 12:00:00 AM	Site id:	AZ7000000028062

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**R132**  
**ESE**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028063**

Program:	55	Registry i:	562971
Owner name:	US EPA REGION 9,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	529		
Approved:	Not Reported	Installed:	8/21/1997 12:00:00 AM
Well depth:	171		
Water leve:	99		
Casing dep:	151		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505438.2		
Utm y mete:	3554595		
Applicatio:	7/15/1997 12:00:00 AM	Site id:	AZ7000000028063



## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**R134**  
**ESE**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028064**

Program:	55	Registry i:	562972
Owner name:	US EPA REGION 9,		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	529		
Approved:	Not Reported	Installed:	7/31/1997 12:00:00 AM
Well depth:	171		
Water leve:	99		
Casing dep:	135		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505438.2		
Utm y mete:	3554595		
Applicatio:	4/11/2000 12:00:00 AM	Site id:	AZ7000000028064

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**R133**  
**ESE**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028065**

Program:	55	Registry i:	562973
Owner name:	US EPA REGION 9,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	529		
Approved:	Not Reported	Installed:	8/28/1997 12:00:00 AM
Well depth:	117		
Water leve:	99		
Casing dep:	116		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505438.2		
Utm y mete:	3554595		
Applicatio:	7/15/1997 12:00:00 AM	Site id:	AZ7000000028065

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**CD521**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028135**

Program:	55	Registry i:	505569
Owner name:	TUCSON WATER		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	22		
Approved:	Not Reported	Installed:	10/26/1983 12:00:00 AM
Well depth:	405		
Water leve:	212		
Casing dep:	360		
Casing dia:	6		
Casing typ:	PLASTIC OR PVC		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR 1 - 5 HP		
Pumprate:	87		
Testedrate:	87		
Draw down:	13		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	502817.9		
Utm y mete:	3554780		
Applicatio:	6/8/1983 12:00:00 AM	Site id:	AZ7000000028135

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**CD522**

**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028136**

Program:	55	Registry i:	505570
Owner name:	TUCSON WATER		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	22		
Approved:	Not Reported	Installed:	11/4/1983 12:00:00 AM
Well depth:	178		
Water leve:	97		
Casing dep:	158		
Casing dia:	6		
Casing typ:	PLASTIC OR PVC		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR 1 - 5 HP		
Pumprate:	110		
Testedrate:	110		
Draw down:	18		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	502817.9		
Utm y mete:	3554780		
Applicatio:	6/8/1983 12:00:00 AM	Site id:	AZ7000000028136

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**CD523**

**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028137**

Program:	55	Registry i:	507244
Owner name:	TUCSON WATER COMPANY		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	22		
Approved:	Not Reported	Installed:	1/20/1984 12:00:00 AM
Well depth:	130		
Water leve:	96		
Casing dep:	130		
Casing dia:	6		
Casing typ:	PLASTIC OR PVC		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR 1 - 5 HP		
Pumprate:	52		
Testedrate:	52		
Draw down:	7		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	502817.9		
Utm y mete:	3554780		
Applicatio:	2/28/1984 12:00:00 AM	Site id:	AZ7000000028137

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AK234**  
**West**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028138**

Program:	55	Registry i:	206901
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	161		
Approved:	3/4/2005 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013013ADA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503624		
Utm y mete:	3554789		
Applicatio:	3/2/2005 12:00:00 AM	Site id:	AZ7000000028138

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AK235**  
**West**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS AZ7000000028139**

Program:	55	Registry i:	569345
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	52		
Approved:	7/13/1998 12:00:00 AM	Installed:	7/20/1998 12:00:00 AM
Well depth:	125		
Water leve:	86		
Casing dep:	101		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ADA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503624		
Utm y mete:	3554789		
Applicatio:	6/22/1998 12:00:00 AM	Site id:	AZ7000000028139

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AK236**  
**West**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS AZ7000000028140**

Program:	55	Registry i:	808151
Owner name:	MANNY CHAVEZ		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	1/10/1940 12:00:00 AM
Well depth:	197		
Water leve:	86		
Casing dep:	150		
Casing dia:	6		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013013ADA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503624		
Utm y mete:	3554789		
Applicatio:	2/20/2001 12:00:00 AM	Site id:	AZ7000000028140



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**190**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028142**

Program:	55	Registry i:	218301
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	8/19/2008 12:00:00 AM	Installed:	12/5/2008 12:00:00 AM
Well depth:	150		
Water leve:	92		
Casing dep:	150		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028142

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**189**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028143**

Program:	55	Registry i:	218302
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	8/19/2008 12:00:00 AM	Installed:	11/20/2008 12:00:00 AM
Well depth:	151		
Water leve:	93		
Casing dep:	150		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028143

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**I88**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028144**

Program:	55	Registry i:	218303
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	8/19/2008 12:00:00 AM	Installed:	11/18/2008 12:00:00 AM
Well depth:	105		
Water leve:	88		
Casing dep:	105		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028144

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**I93**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028145**

Program:	55	Registry i:	218304
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	8/19/2008 12:00:00 AM	Installed:	12/3/2008 12:00:00 AM
Well depth:	105		
Water leve:	86		
Casing dep:	105		
Casing dia:	0		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028145

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**192**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028146**

Program:	55	Registry i:	218331
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	INJECTION
Well type :	NON-EXEMPT		
Dlic num:	83		
Approved:	8/21/2008 12:00:00 AM	Installed:	12/5/2008 12:00:00 AM
Well depth:	105		
Water leve:	84		
Casing dep:	105		
Casing dia:	0		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028146

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**I91**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028147**

Program:	55	Registry i:	218332
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	INJECTION
Well type :	NON-EXEMPT		
Dlic num:	83		
Approved:	8/21/2008 12:00:00 AM	Installed:	10/17/2008 12:00:00 AM
Well depth:	151		
Water leve:	95		
Casing dep:	151		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028147

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**I87**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028148**

Program:	55	Registry i:	218333
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	INJECTION
Well type :	NON-EXEMPT		
Dlic num:	83		
Approved:	8/21/2008 12:00:00 AM	Installed:	10/22/2008 12:00:00 AM
Well depth:	151		
Water leve:	94		
Casing dep:	151		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028148

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**I75**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028149**

Program:	55	Registry i:	218334
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	INJECTION
Well type :	NON-EXEMPT		
Dlic num:	83		
Approved:	8/21/2008 12:00:00 AM	Installed:	10/30/2008 12:00:00 AM
Well depth:	150		
Water leve:	93		
Casing dep:	150		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028149



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

I74  
WSW  
1/4 - 1/2 Mile  
Higher

AZ WELLS AZ7000000028150

Program:	55	Registry i:	218335
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	INJECTION
Well type :	NON-EXEMPT		
Dlic num:	83		
Approved:	8/21/2008 12:00:00 AM	Installed:	11/7/2008 12:00:00 AM
Well depth:	150		
Water leve:	92		
Casing dep:	150		
Casing dia:	0		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028150

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

I77  
WSW  
1/4 - 1/2 Mile  
Higher

AZ WELLS AZ7000000028151

Program:	55	Registry i:	218336
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	INJECTION
Well type :	NON-EXEMPT		
Dlic num:	83		
Approved:	8/21/2008 12:00:00 AM	Installed:	11/18/2008 12:00:00 AM
Well depth:	151		
Water leve:	94		
Casing dep:	151		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028151

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**I76**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028152**

Program:	55	Registry i:	218337
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	INJECTION
Well type :	NON-EXEMPT		
Dlic num:	83		
Approved:	8/21/2008 12:00:00 AM	Installed:	12/3/2008 12:00:00 AM
Well depth:	150		
Water leve:	92		
Casing dep:	150		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028152

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**I71**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028153**

Program:	55	Registry i:	218126
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	INJECTION
Well type :	NON-EXEMPT		
Dlic num:	83		
Approved:	8/21/2008 12:00:00 AM	Installed:	10/27/2008 12:00:00 AM
Well depth:	104		
Water leve:	94		
Casing dep:	104		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028153

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**I70**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028154**

Program:	55	Registry i:	218128
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	INJECTION
Well type :	NON-EXEMPT		
Dlic num:	83		
Approved:	8/21/2008 12:00:00 AM	Installed:	11/4/2008 12:00:00 AM
Well depth:	105		
Water leve:	89		
Casing dep:	103		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028154

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**I73**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028155**

Program:	55	Registry i:	218129
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	INJECTION
Well type :	NON-EXEMPT		
Dlic num:	83		
Approved:	8/21/2008 12:00:00 AM	Installed:	11/13/2008 12:00:00 AM
Well depth:	105		
Water leve:	88		
Casing dep:	105		
Casing dia:	0		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028155

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**I72**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028156**

Program:	55	Registry i:	218130
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	INJECTION
Well type :	NON-EXEMPT		
Dlic num:	83		
Approved:	8/21/2008 12:00:00 AM	Installed:	11/17/2008 12:00:00 AM
Well depth:	105		
Water leve:	89		
Casing dep:	105		
Casing dia:	0		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028156

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**I78**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028157**

Program:	55	Registry i:	218131
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	INJECTION
Well type :	NON-EXEMPT		
Dlic num:	83		
Approved:	8/21/2008 12:00:00 AM	Installed:	11/20/2008 12:00:00 AM
Well depth:	105		
Water leve:	87		
Casing dep:	105		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028157



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**I84**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028158**

Program:	55	Registry i:	218142
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	OTHER
Well type :	OTHER		
Dlic num:	83		
Approved:	8/20/2008 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028158

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**I83**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028159**

Program:	55	Registry i:	218143
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	OTHER
Well type :	OTHER		
Dlic num:	83		
Approved:	8/20/2008 12:00:00 AM	Installed:	12/11/2008 12:00:00 AM
Well depth:	151		
Water leve:	92		
Casing dep:	150		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	2		
Testedrate:	2		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028159

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**I86**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028160**

Program:	55	Registry i:	218144
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	OTHER
Well type :	OTHER		
Dlic num:	83		
Approved:	8/20/2008 12:00:00 AM	Installed:	12/9/2008 12:00:00 AM
Well depth:	150		
Water leve:	93		
Casing dep:	150		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	2		
Testedrate:	2		
Draw down:	59		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028160

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**I85**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028161**

Program:	55	Registry i:	218145
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	OTHER
Well type :	OTHER		
Dlic num:	83		
Approved:	8/20/2008 12:00:00 AM	Installed:	12/12/2008 12:00:00 AM
Well depth:	150		
Water leve:	89		
Casing dep:	150		
Casing dia:	0		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	2		
Testedrate:	2		
Draw down:	61		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028161

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**180**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028162**

Program:	55	Registry i:	218146
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	OTHER
Well type :	OTHER		
Dlic num:	83		
Approved:	8/20/2008 12:00:00 AM	Installed:	12/17/2008 12:00:00 AM
Well depth:	105		
Water leve:	79		
Casing dep:	105		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	1		
Testedrate:	1		
Draw down:	1		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028162

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**I79**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028163**

Program:	55	Registry i:	218147
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	OTHER
Well type :	OTHER		
Dlic num:	83		
Approved:	8/20/2008 12:00:00 AM	Installed:	12/9/2008 12:00:00 AM
Well depth:	150		
Water leve:	89		
Casing dep:	150		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	2		
Testedrate:	2		
Draw down:	24		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	8/15/2008 12:00:00 AM	Site id:	AZ7000000028163

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**I82**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028164**

Program:	55	Registry i:	569763
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	PIEZOMETER
Well type :	MONITOR		
Dlic num:	161		
Approved:	8/5/1998 12:00:00 AM	Installed:	8/7/1998 12:00:00 AM
Well depth:	108		
Water leve:	87		
Casing dep:	108		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	7/16/1998 12:00:00 AM	Site id:	AZ7000000028164

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**I81**  
**WSW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028165**

Program:	55	Registry i:	575741
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	PIEZOMETER
Well type :	MONITOR		
Dlic num:	473		
Approved:	7/1/1999 12:00:00 AM	Installed:	10/12/1999 12:00:00 AM
Well depth:	100		
Water leve:	90		
Casing dep:	100		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.7		
Utm y mete:	3554792		
Applicatio:	6/21/1999 12:00:00 AM	Site id:	AZ7000000028165



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

31  
SSW  
1/8 - 1/4 Mile  
Higher

AZ WELLS AZ7000000028166

Program:	55	Registry i:	216988
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	1/16/2008 12:00:00 AM	Installed:	2/15/2008 12:00:00 AM
Well depth:	155		
Water leve:	0		
Casing dep:	125		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ACB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504631.1		
Utm y mete:	3554793		
Applicatio:	1/9/2008 12:00:00 AM	Site id:	AZ7000000028166

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

19  
SSE  
1/8 - 1/4 Mile  
Higher

AZ WELLS AZ7000000028167

Program:	55	Registry i:	216989
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	1/16/2008 12:00:00 AM	Installed:	2/12/2008 12:00:00 AM
Well depth:	100		
Water leve:	0		
Casing dep:	98		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ACA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504832.5		
Utm y mete:	3554794		
Applicatio:	1/9/2008 12:00:00 AM	Site id:	AZ7000000028167

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**F53**  
**SE**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS AZ7000000028171**

Program:	55	Registry i:	523754
Owner name:	AZ ANG,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	5/4/1989 12:00:00 AM
Well depth:	143		
Water leve:	0		
Casing dep:	140		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ADB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033.9		
Utm y mete:	3554795		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028171

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**F54**  
**SE**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028172**

Program:	55	Registry i:	523755
Owner name:	AZ ANG,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	5/14/1989 12:00:00 AM
Well depth:	98		
Water leve:	0		
Casing dep:	97		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ADB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033.9		
Utm y mete:	3554795		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028172

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**F51**  
**SE**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS AZ7000000028173**

Program:	55	Registry i:	525127
Owner name:	AZ AIR NATL GUARD,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	314	Installed:	10/7/1989 12:00:00 AM
Approved:	Not Reported		
Well depth:	138		
Water leve:	92		
Casing dep:	136		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ADB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033.9		
Utm y mete:	3554795		
Applicatio:	6/28/1989 12:00:00 AM	Site id:	AZ7000000028173

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**F52**  
**SE**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS AZ7000000028174**

Program:	55	Registry i:	525128
Owner name:	AZ AIR NATL GUARD,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	314	Installed:	10/9/1989 12:00:00 AM
Approved:	Not Reported		
Well depth:	105		
Water leve:	92		
Casing dep:	104		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ADB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033.9		
Utm y mete:	3554795		
Applicatio:	6/12/1989 12:00:00 AM	Site id:	AZ7000000028174

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**F57**  
**SE**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS      AZ7000000028175**

Program:	55	Registry i:	525131
Owner name:	AZ AIR NATL GUARD,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	9/21/1989 12:00:00 AM
Well depth:	138		
Water leve:	91		
Casing dep:	138		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ADB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033.9		
Utm y mete:	3554795		
Applicatio:	6/28/1989 12:00:00 AM	Site id:	AZ7000000028175

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**F58**  
**SE**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS AZ7000000028176**

Program:	55	Registry i:	525132
Owner name:	AZ AIR NATL GUARD,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	9/23/1989 12:00:00 AM
Well depth:	97		
Water leve:	91		
Casing dep:	97		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ADB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033.9		
Utm y mete:	3554795		
Applicatio:	6/12/1989 12:00:00 AM	Site id:	AZ7000000028176



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**F55**  
**SE**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS AZ7000000028177**

Program:	55	Registry i:	525133
Owner name:	AZ AIR NATL GUARD,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	10/20/1989 12:00:00 AM
Well depth:	105		
Water leve:	91		
Casing dep:	104		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ADB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033.9		
Utm y mete:	3554795		
Applicatio:	6/12/1989 12:00:00 AM	Site id:	AZ7000000028177

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**F56**  
**SE**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS AZ7000000028178**

Program:	55	Registry i:	525134
Owner name:	AZ AIR NATL GUARD,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	10/25/1989 12:00:00 AM
Well depth:	110		
Water leve:	90		
Casing dep:	110		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ADB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033.9		
Utm y mete:	3554795		
Applicatio:	6/12/1989 12:00:00 AM	Site id:	AZ7000000028178

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BM412**  
**East**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS AZ7000000028179**

Program:	55	Registry i:	482113
Owner name:	TUCAIRRI PROPERTY L P		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	580		
Approved:	Not Reported	Installed:	12/31/2005 12:00:00 AM
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	A	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014017ACA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	506460.4		
Utm y mete:	3554796		
Applicatio:	9/19/2006 12:00:00 AM	Site id:	AZ7000000028179

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BM413**  
**East**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS AZ7000000028180**

Program:	55	Registry i:	482114
Owner name:	TUCAIRRI PROPERTY L P		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	580		
Approved:	Not Reported	Installed:	12/31/2005 12:00:00 AM
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	A	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014017ACA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	506460.4		
Utm y mete:	3554796		
Applicatio:	9/19/2006 12:00:00 AM	Site id:	AZ7000000028180

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BC340**

**East  
1/2 - 1 Mile  
Higher**

**AZ WELLS**

**AZ7000000028181**

Program:	55	Registry i:	568659
Owner name:	ENVIRONMENTAL PROTECTION AGENCY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	620		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014017ACB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	506256		
Utm y mete:	3554796		
Applicatio:	5/20/1998 12:00:00 AM	Site id:	AZ7000000028181

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BC341**

**East  
1/2 - 1 Mile  
Higher**

**AZ WELLS**

**AZ7000000028182**

Program:	55	Registry i:	568660
Owner name:	ENVIRONMENTAL PROTECTION AGENCY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	620		
Approved:	Not Reported	Installed:	6/10/1998 12:00:00 AM
Well depth:	144		
Water leve:	113		
Casing dep:	110		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017ACB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	506256		
Utm y mete:	3554796		
Applicatio:	5/20/1998 12:00:00 AM	Site id:	AZ7000000028182

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BC342**

**East  
1/2 - 1 Mile  
Higher**

**AZ WELLS**

**AZ7000000028183**

Program:	55	Registry i:	807406
Owner name:	BROCK, HERSCHEL,		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	580		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	123		
Water leve:	0		
Casing dep:	0		
Casing dia:	8		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014017ACB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	506256		
Utm y mete:	3554796		
Applicatio:	11/20/1996 12:00:00 AM	Site id:	AZ7000000028183

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AO281**  
**East**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028184**

Program:	55	Registry i:	519216
Owner name:	BURR-BROWN CORP,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	YES		
Well type :	MONITOR		
Dlic num:	7		
Approved:	Not Reported	Installed:	10/10/1987 12:00:00 AM
Well depth:	140		
Water leve:	0		
Casing dep:	20		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	506051.5		
Utm y mete:	3554796		
Applicatio:	10/1/1987 12:00:00 AM	Site id:	AZ7000000028184



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AO282**

**East  
1/2 - 1 Mile  
Higher**

**AZ WELLS**

**AZ7000000028185**

Program:	55	Registry i:	518757
Owner name:	BURR-BROWN CORP,	Welltype:	MONITOR
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	7		
Approved:	Not Reported	Installed:	8/17/1987 12:00:00 AM
Well depth:	141		
Water leve:	120		
Casing dep:	140		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	C	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	506051.5		
Utm y mete:	3554796		
Applicatio:	8/11/1987 12:00:00 AM	Site id:	AZ7000000028185

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AO283**

**East  
1/2 - 1 Mile  
Higher**

**AZ WELLS AZ7000000028186**

Program:	55	Registry i:	909074
Owner name:	TEXAS INSTRUMENTS, INC		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	161		
Approved:	5/22/2008 2:17:45 PM	Installed:	5/29/2008 12:00:00 AM
Well depth:	135		
Water leve:	110		
Casing dep:	120		
Casing dia:	1		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	506051.5		
Utm y mete:	3554796		
Applicatio:	5/22/2008 2:17:45 PM	Site id:	AZ7000000028186

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AD193**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028187**

Program:	55	Registry i:	532575
Owner name:	BURR-BROWN CORP,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	YES		
Well type :	MONITOR		
Dlic num:	549		
Approved:	Not Reported	Installed:	8/17/1991 12:00:00 AM
Well depth:	151		
Water leve:	106		
Casing dep:	151		
Casing dia:	11		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BDB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505847.1		
Utm y mete:	3554796		
Applicatio:	7/31/1991 12:00:00 AM	Site id:	AZ7000000028187

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AD194**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028188**

Program:	55	Registry i:	532328
Owner name:	BURR-BROWN CORP,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	7/10/1991 12:00:00 AM
Well depth:	135		
Water leve:	100		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Y	Cadastral:	D15014017BDB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505847.1		
Utm y mete:	3554796		
Applicatio:	7/8/1991 12:00:00 AM	Site id:	AZ7000000028188

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

147  
ESE  
1/2 - 1 Mile  
Higher

AZ WELLS

AZ7000000028189

Program:	55	Registry i:	202797
Owner name:	US ENVIRONMENTAL PROTECTION AGENCY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	498		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	150		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014017BCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	505642.7		
Utm y mete:	3554796		
Applicatio:	3/15/2004 12:00:00 AM	Site id:	AZ7000000028189

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

126  
ESE  
1/4 - 1/2 Mile  
Higher

AZ WELLS AZ7000000028190

Program:	55	Registry i:	562974
Owner name:	US EPA REGION 9,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	529		
Approved:	Not Reported	Installed:	8/25/1997 12:00:00 AM
Well depth:	117		
Water leve:	99		
Casing dep:	116		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505437.6		
Utm y mete:	3554796		
Applicatio:	7/15/1997 12:00:00 AM	Site id:	AZ7000000028190

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AZ330**  
**West**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028205**

Program:	55	Registry i:	639278
Owner name:	GEYLER,T A		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013013A00
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	0	Qacre40dir:	Not Reported
Quarter 10:	0	Qacre10dir:	Not Reported
Utm x mete:	503321.8		
Utm y mete:	3554887		
Applicatio:	6/14/1982 12:00:00 AM	Site id:	AZ7000000028205

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AZ331**  
**West**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS** **AZ7000000028206**

Program:	55	Registry i:	636503
Owner name:	MAC NAUGHTON,H K		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	130		
Water leve:	110		
Casing dep:	130		
Casing dia:	8		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	12		
Testedrate:	12		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013013A00
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	0	Qacre40dir:	Not Reported
Quarter 10:	0	Qacre10dir:	Not Reported
Utm x mete:	503321.8		
Utm y mete:	3554887		
Applicatio:	6/14/1982 12:00:00 AM	Site id:	AZ7000000028206



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AZ332**  
**West**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028207**

Program:	55	Registry i:	639458
Owner name:	TRAPPMAN,R		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	275		
Water leve:	0		
Casing dep:	0		
Casing dia:	8		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	34		
Testedrate:	34		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013013A00
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	0	Qacre40dir:	Not Reported
Quarter 10:	0	Qacre10dir:	Not Reported
Utm x mete:	503321.8		
Utm y mete:	3554887		
Applicatio:	6/14/1982 12:00:00 AM	Site id:	AZ7000000028207

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

17  
SE  
0 - 1/8 Mile  
Higher

AZ WELLS

AZ7000000028208

Program:	55	Registry i:	607501
Owner name:	AZ AIR NATL GUARD,		
Rgr pump d:	YES	Welltype:	NON-EXEMPT
Well type :	NON-EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	9/8/1958 12:00:00 AM
Well depth:	400		
Water leve:	95		
Casing dep:	300		
Casing dia:	12		
Casing typ:	WALLED OR SHORED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	125		
Testedrate:	0		
Draw down:	0		
Completion:	A	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018A00
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	0	Qacre40dir:	Not Reported
Quarter 10:	0	Qacre10dir:	Not Reported
Utm x mete:	504932.6		
Utm y mete:	3554895		
Applicatio:	4/6/1982 12:00:00 AM	Site id:	AZ7000000028208

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BP432**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028239**

Program:	55	Registry i:	529337
Owner name:	SOUTHWEST GAS CORP,		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	499		
Approved:	Not Reported	Installed:	9/17/1990 12:00:00 AM
Well depth:	228		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503019.7		
Utm y mete:	3554985		
Applicatio:	8/28/1990 12:00:00 AM	Site id:	AZ7000000028239

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BP433**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028240**

Program:	55	Registry i:	619998
Owner name:	TUCSON, CITY OF,		
Rgr pump d:	NO	Welltype:	NON-EXEMPT
Well type :	NON-EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	5/1/1952 12:00:00 AM
Well depth:	142		
Water leve:	0		
Casing dep:	142		
Casing dia:	8		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15013013ABC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503019.7		
Utm y mete:	3554985		
Applicatio:	6/9/1982 12:00:00 AM	Site id:	AZ7000000028240

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BP434**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028241**

Program:	55	Registry i:	619999
Owner name:	TUCSON, CITY OF,		
Rgr pump d:	NO	Welltype:	NON-EXEMPT
Well type :	NON-EXEMPT		
Dlic num:	388		
Approved:	Not Reported	Installed:	2/1/1966 12:00:00 AM
Well depth:	1000		
Water leve:	201		
Casing dep:	1000		
Casing dia:	16		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	368		
Testedrate:	368		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15013013ABC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503019.7		
Utm y mete:	3554985		
Applicatio:	6/9/1982 12:00:00 AM	Site id:	AZ7000000028241

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AR291**  
**West**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028245**

Program:	55	Registry i:	504630
Owner name:	EPA REGION 9,		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	25		
Approved:	Not Reported	Installed:	1/25/1983 12:00:00 AM
Well depth:	393		
Water leve:	221		
Casing dep:	393		
Casing dia:	8		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR < 1 HP		
Pumprate:	12		
Testedrate:	12		
Draw down:	40		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013AAC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503422.5		
Utm y mete:	3554990		
Applicatio:	1/13/1983 12:00:00 AM	Site id:	AZ7000000028245

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**B6**  
**West**  
**0 - 1/8 Mile**  
**Higher**

**AZ WELLS AZ7000000028254**

Program:	55	Registry i:	523743
Owner name:	AZ ANG,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	314	Installed:	5/1/1989 12:00:00 AM
Approved:	Not Reported		
Well depth:	143		
Water leve:	0		
Casing dep:	143		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Y	Cadastral:	D15014018ABC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	504630.8		
Utm y mete:	3554995		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028254

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**B7**  
**West**  
**0 - 1/8 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028255**

Program:	55	Registry i:	523745
Owner name:	AZ ANG,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	5/16/1989 12:00:00 AM
Well depth:	160		
Water leve:	0		
Casing dep:	103		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ABC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	504630.8		
Utm y mete:	3554995		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028255



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**B4**  
**West**  
**0 - 1/8 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028256**

Program:	55	Registry i:	523746
Owner name:	AZ ANG,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	5/12/1989 12:00:00 AM
Well depth:	143		
Water leve:	0		
Casing dep:	142		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ABC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	504630.8		
Utm y mete:	3554995		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028256

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**B5**  
**West**  
**0 - 1/8 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028257**

Program:	55	Registry i:	523747
Owner name:	AZ ANG,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	5/2/1989 12:00:00 AM
Well depth:	101		
Water leve:	0		
Casing dep:	101		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ABC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	504630.8		
Utm y mete:	3554995		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028257

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**B8**  
**West**  
**0 - 1/8 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028258**

Program:	55	Registry i:	558677
Owner name:	AZ AIR NAT'L GUARD,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	22		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018ABC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	504630.8		
Utm y mete:	3554995		
Applicatio:	7/2/1996 12:00:00 AM	Site id:	AZ7000000028258

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**B11**  
**West**  
**0 - 1/8 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028259**

Program:	55	Registry i:	558680
Owner name:	AZ AIR NAT'L GUARD,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	22		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018ABC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	504630.8		
Utm y mete:	3554995		
Applicatio:	7/2/1996 12:00:00 AM	Site id:	AZ7000000028259

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**B12**  
**West**  
**0 - 1/8 Mile**  
**Higher**

**AZ WELLS AZ7000000028260**

Program:	55	Registry i:	558683
Owner name:	AZ AIR NAT'L GUARD,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	22		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	45		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018ABC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	504630.8		
Utm y mete:	3554995		
Applicatio:	7/2/1996 12:00:00 AM	Site id:	AZ7000000028260

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**B9**  
**West**  
**0 - 1/8 Mile**  
**Higher**

**AZ WELLS AZ7000000028261**

Program:	55	Registry i:	558687
Owner name:	AZ AIR NAT'L GUARD,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	22		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018ABC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	504630.8		
Utm y mete:	3554995		
Applicatio:	7/2/1996 12:00:00 AM	Site id:	AZ7000000028261

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**B10**  
**West**  
**0 - 1/8 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028262**

Program:	55	Registry i:	558688
Owner name:	AZ AIR NAT'L GUARD,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	22		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018ABC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	504630.8		
Utm y mete:	3554995		
Applicatio:	7/2/1996 12:00:00 AM	Site id:	AZ7000000028262

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**G60**  
**West**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS AZ7000000028263**

Program:	55	Registry i:	558678
Owner name:	AZ AIR NAT'L GUARD,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	22		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018BAD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504429.5		
Utm y mete:	3554995		
Applicatio:	7/2/1996 12:00:00 AM	Site id:	AZ7000000028263



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**G59**  
**West**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS AZ7000000028264**

Program:	55	Registry i:	558681
Owner name:	AZ AIR NAT'L GUARD,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	22		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018BAD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504429.5		
Utm y mete:	3554995		
Applicatio:	7/2/1996 12:00:00 AM	Site id:	AZ7000000028264

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**G61**  
**West**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS AZ7000000028265**

Program:	55	Registry i:	558684
Owner name:	AZ AIR NAT'L GUARD,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	22		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018BAD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504429.5		
Utm y mete:	3554995		
Applicatio:	7/2/1996 12:00:00 AM	Site id:	AZ7000000028265

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**G63**  
**West**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS AZ7000000028266**

Program:	55	Registry i:	558689
Owner name:	AZ AIR NAT'L GUARD,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	22		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018BAD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504429.5		
Utm y mete:	3554995		
Applicatio:	7/2/1996 12:00:00 AM	Site id:	AZ7000000028266

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**G62**  
**West**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS AZ7000000028267**

Program:	55	Registry i:	581084
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	161		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	N	Cadastral:	D15014018BAD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504429.5		
Utm y mete:	3554995		
Applicatio:	5/9/2000 12:00:00 AM	Site id:	AZ7000000028267

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**A1**  
**ESE**  
**0 - 1/8 Mile**  
**Higher**

**AZ WELLS AZ7000000028268**

Program:	55	Registry i:	523737
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	YES	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	83		
Approved:	Not Reported	Installed:	5/22/1989 12:00:00 AM
Well depth:	150		
Water leve:	0		
Casing dep:	20		
Casing dia:	6		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ABD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504832.2		
Utm y mete:	3554996		
Applicatio:	3/22/1989 12:00:00 AM	Site id:	AZ7000000028268

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

A2  
ESE  
0 - 1/8 Mile  
Higher

AZ WELLS

AZ7000000028269

Program:	55	Registry i:	523749
Owner name:	AZ ANG,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	5/2/1989 12:00:00 AM
Well depth:	103		
Water leve:	0		
Casing dep:	101		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ABD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504832.2		
Utm y mete:	3554996		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028269

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**A3**  
**ESE**  
**0 - 1/8 Mile**  
**Higher**

**AZ WELLS AZ7000000028270**

Program:	55	Registry i:	523750
Owner name:	AZ ANG,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	5/3/1989 12:00:00 AM
Well depth:	140		
Water leve:	0		
Casing dep:	138		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ABD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504832.2		
Utm y mete:	3554996		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028270

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**143**  
**East**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028271**

Program:	55	Registry i:	507245
Owner name:	TUCSON WATER		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	342		
Approved:	Not Reported	Installed:	7/6/1984 12:00:00 AM
Well depth:	194		
Water leve:	98		
Casing dep:	190		
Casing dia:	16		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR 1 - 5 HP		
Pumprate:	58		
Testedrate:	58		
Draw down:	10		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BBD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	505642.1		
Utm y mete:	3554997		
Applicatio:	2/17/1984 12:00:00 AM	Site id:	AZ7000000028271



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**L103**

**East**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028272**

Program:	55	Registry i:	523735
Owner name:	AZ ANG,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	5/14/1989 12:00:00 AM
Well depth:	163		
Water leve:	0		
Casing dep:	150		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018AAD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	505234.8		
Utm y mete:	3554997		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028272

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**L102**

**East**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028273**

Program:	55	Registry i:	523736
Owner name:	AZ ANG,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	4/28/1989 12:00:00 AM
Well depth:	106		
Water leve:	0		
Casing dep:	106		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018AAD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	505234.8		
Utm y mete:	3554997		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028273

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**L105**  
**East**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028274**

Program:	55	Registry i:	524692
Owner name:	AZ AIR NATL GUARD,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	314	Installed:	10/23/1989 12:00:00 AM
Approved:	Not Reported		
Well depth:	135		
Water leve:	91		
Casing dep:	135		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018AAD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	505234.8		
Utm y mete:	3554997		
Applicatio:	5/26/1989 12:00:00 AM	Site id:	AZ7000000028274

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**L104**  
**East**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028275**

Program:	55	Registry i:	524693
Owner name:	AZ AIR NATL GUARD,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	10/24/1989 12:00:00 AM
Well depth:	100		
Water leve:	91		
Casing dep:	100		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018AAD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	505234.8		
Utm y mete:	3554997		
Applicatio:	5/26/1989 12:00:00 AM	Site id:	AZ7000000028275

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

503  
East  
1 - 2 Miles  
Higher

AZ WELLS

AZ7000000028276

Program:	55	Registry i:	638465
Owner name:	WILLARD W SHEPHERD		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	145		
Water leve:	130		
Casing dep:	200		
Casing dia:	7		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	35		
Testedrate:	35		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014017AAC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	506664.1		
Utm y mete:	3554998		
Applicatio:	6/14/1982 12:00:00 AM	Site id:	AZ7000000028276

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BJ398**  
**East**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS**

**AZ7000000028277**

Program:	55	Registry i:	530086
Owner name:	CBS PROPERTY SERVICE,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	269		
Approved:	Not Reported	Installed:	12/4/1990 12:00:00 AM
Well depth:	142		
Water leve:	132		
Casing dep:	142		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017ABD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	506459.7		
Utm y mete:	3554998		
Applicatio:	11/13/1990 12:00:00 AM	Site id:	AZ7000000028277

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BJ399**  
**East**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS AZ7000000028278**

Program:	55	Registry i:	801458
Owner name:	RED HAWK MARANA LLC,		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	140		
Casing dep:	0		
Casing dia:	8		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	35		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014017ABD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	506459.7		
Utm y mete:	3554998		
Applicatio:	4/16/1984 12:00:00 AM	Site id:	AZ7000000028278

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BJ400**  
**East**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS**

**AZ7000000028279**

Program:	55	Registry i:	801460
Owner name:	RED HAWK MARANA LLC,		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	140		
Casing dep:	0		
Casing dia:	6		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	35		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014017ABD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	506459.7		
Utm y mete:	3554998		
Applicatio:	4/16/1984 12:00:00 AM	Site id:	AZ7000000028279



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**280**  
**East**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028280**

Program:	55	Registry i:	531282
Owner name:	BURR-BROWN CORP,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	473		
Approved:	Not Reported	Installed:	3/22/1991 12:00:00 AM
Well depth:	150		
Water leve:	100		
Casing dep:	150		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BAD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	506050.8		
Utm y mete:	3554998		
Applicatio:	3/15/1991 12:00:00 AM	Site id:	AZ7000000028280

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AB186**  
**East**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028281**

Program:	55	Registry i:	527757
Owner name:	BURR-BROWN CORP,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	YES		
Well type :	MONITOR		
Dlic num:	342		
Approved:	Not Reported	Installed:	6/6/1990 12:00:00 AM
Well depth:	148		
Water leve:	107		
Casing dep:	145		
Casing dia:	6		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BAC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505846.5		
Utm y mete:	3554998		
Applicatio:	4/16/1990 12:00:00 AM	Site id:	AZ7000000028281

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AB187**

**East  
1/2 - 1 Mile  
Higher**

**AZ WELLS**

**AZ7000000028282**

Program:	55	Registry i:	531281
Owner name:	BURR- BROWN CORPORATION		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	611		
Approved:	Not Reported	Installed:	3/22/1991 12:00:00 AM
Well depth:	150		
Water leve:	100		
Casing dep:	150		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BAC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505846.5		
Utm y mete:	3554998		
Applicatio:	3/15/1991 12:00:00 AM	Site id:	AZ7000000028282

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AB188**

**East  
1/2 - 1 Mile  
Higher**

**AZ WELLS**

**AZ7000000028283**

Program:	55	Registry i:	577715
Owner name:	BURR-BROWN CORPORATION		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	611		
Approved:	10/28/1999 12:00:00 AM	Installed:	11/11/1999 12:00:00 AM
Well depth:	150		
Water leve:	108		
Casing dep:	90		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BAC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505846.5		
Utm y mete:	3554998		
Applicatio:	10/12/1999 12:00:00 AM	Site id:	AZ7000000028283

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**532**  
**East**  
**1 - 2 Miles**  
**Higher**

**AZ WELLS**

**AZ7000000028293**

Program:	55	Registry i:	800645
Owner name:	LAWYERS TITLE OF AZ,		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014017AA0
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	0	Qacre10dir:	Not Reported
Utm x mete:	506765.8		
Utm y mete:	3555100		
Applicatio:	7/5/1983 12:00:00 AM	Site id:	AZ7000000028293

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

520  
West  
1 - 2 Miles  
Lower

AZ WELLS AZ7000000028341

Program:	55	Registry i:	913062
Owner name:	EXXONMOBIL ENVIRONMENTAL SERVICES		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	78		
Approved:	3/17/2011 7:40:31 AM	Installed:	3/21/2011 12:00:00 AM
Well depth:	85		
Water leve:	0		
Casing dep:	85		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013BAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	502818.3		
Utm y mete:	3555186		
Applicatio:	3/17/2011 7:40:31 AM	Site id:	AZ7000000028341

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ445**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028343**

Program:	55	Registry i:	200782
Owner name:	EXXON MOBIL OIL ENVIRONMENTAL SERVICES COMPANY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	78		
Approved:	10/16/2003 12:00:00 AM	Installed:	Not Reported
Well depth:	129		
Water leve:	94		
Casing dep:	129		
Casing dia:	6		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	10/7/2003 12:00:00 AM	Site id:	AZ7000000028343

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ444**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028344**

Program:	55	Registry i:	200783
Owner name:	EXXON MOBIL OIL ENVIRONMENTAL SERVICES COMPANY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	78		
Approved:	10/16/2003 12:00:00 AM	Installed:	Not Reported
Well depth:	129		
Water leve:	94		
Casing dep:	129		
Casing dia:	6		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	10/7/2003 12:00:00 AM	Site id:	AZ7000000028344



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ443**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028345**

Program:	55	Registry i:	217613
Owner name:	EXXON MOBIL OIL ENVIRONMENTAL SERVICES COMPANY		
Rgr pump d:	NO	Welltype:	AIR SPARGING
Well type :	OTHER		
Dlic num:	78		
Approved:	4/4/2008 12:00:00 AM	Installed:	5/13/2008 12:00:00 AM
Well depth:	100		
Water leve:	88		
Casing dep:	100		
Casing dia:	1		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	3/25/2008 12:00:00 AM	Site id:	AZ7000000028345

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ446**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028346**

Program:	55	Registry i:	217614
Owner name:	EXXON MOBIL OIL ENVIRONMENTAL SERVICES COMPANY		
Rgr pump d:	NO	Welltype:	AIR SPARGING
Well type :	OTHER		
Dlic num:	78		
Approved:	4/4/2008 12:00:00 AM	Installed:	5/8/2008 12:00:00 AM
Well depth:	99		
Water leve:	88		
Casing dep:	98		
Casing dia:	1		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	3/25/2008 12:00:00 AM	Site id:	AZ7000000028346

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ449**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028347**

Program:	55	Registry i:	218625
Owner name:	EXXON MOBIL OIL CORPORATION		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	78		
Approved:	1/26/2009 12:00:00 AM	Installed:	2/26/2009 12:00:00 AM
Well depth:	90		
Water leve:	0		
Casing dep:	80		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	1/14/2009 12:00:00 AM	Site id:	AZ7000000028347

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ448**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028348**

Program:	55	Registry i:	218626
Owner name:	EXXON MOBIL OIL CORPORATION		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	78		
Approved:	1/26/2009 12:00:00 AM	Installed:	2/24/2009 12:00:00 AM
Well depth:	90		
Water leve:	0		
Casing dep:	0		
Casing dia:	9		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	1/14/2009 12:00:00 AM	Site id:	AZ7000000028348

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BQ447**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028349**

Program:	55	Registry i:	505571
Owner name:	TUCSON WATER		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	22		
Approved:	Not Reported	Installed:	11/22/1983 12:00:00 AM
Well depth:	190		
Water leve:	100		
Casing dep:	160		
Casing dia:	6		
Casing typ:	PLASTIC OR PVC		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR 1 - 5 HP		
Pumprate:	14		
Testedrate:	14		
Draw down:	12		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	6/8/1983 12:00:00 AM	Site id:	AZ7000000028349

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BQ442**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028350**

Program:	55	Registry i:	505572
Owner name:	TUCSON WATER		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	22		
Approved:	Not Reported	Installed:	12/5/1983 12:00:00 AM
Well depth:	390		
Water leve:	208		
Casing dep:	373		
Casing dia:	6		
Casing typ:	PLASTIC OR PVC		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR 1 - 5 HP		
Pumprate:	50		
Testedrate:	50		
Draw down:	70		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	6/8/1983 12:00:00 AM	Site id:	AZ7000000028350

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ437**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028351**

Program:	55	Registry i:	549372
Owner name:	EXXON CO USA,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	175		
Approved:	Not Reported	Installed:	6/20/1995 12:00:00 AM
Well depth:	96		
Water leve:	75		
Casing dep:	60		
Casing dia:	2		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	5/9/1995 12:00:00 AM	Site id:	AZ7000000028351

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ436**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028352**

Program:	55	Registry i:	549373
Owner name:	EXXON CO USA,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	175		
Approved:	Not Reported	Installed:	6/20/1995 12:00:00 AM
Well depth:	96		
Water leve:	70		
Casing dep:	58		
Casing dia:	2		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	5/9/1995 12:00:00 AM	Site id:	AZ7000000028352



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ435**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028353**

Program:	55	Registry i:	549374
Owner name:	EXXON CO USA,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	175		
Approved:	Not Reported	Installed:	6/19/1995 12:00:00 AM
Well depth:	96		
Water leve:	75		
Casing dep:	60		
Casing dia:	2		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	5/9/1995 12:00:00 AM	Site id:	AZ7000000028353

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BQ438**

**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028354**

Program:	55	Registry i:	553022
Owner name:	EXXON CO USA,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	175		
Approved:	Not Reported	Installed:	1/11/1996 12:00:00 AM
Well depth:	115		
Water leve:	93		
Casing dep:	85		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	11/13/1995 12:00:00 AM	Site id:	AZ7000000028354

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ441**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028355**

Program:	55	Registry i:	553023
Owner name:	EXXON CO USA,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	175		
Approved:	Not Reported	Installed:	1/8/1996 12:00:00 AM
Well depth:	115		
Water leve:	93		
Casing dep:	85		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	11/13/1995 12:00:00 AM	Site id:	AZ7000000028355

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ440**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028356**

Program:	55	Registry i:	555080
Owner name:	EXXON CO USA,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	175		
Approved:	Not Reported	Installed:	3/28/1996 12:00:00 AM
Well depth:	115		
Water leve:	93		
Casing dep:	85		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	2/9/1996 12:00:00 AM	Site id:	AZ7000000028356

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ439**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028357**

Program:	55	Registry i:	563067
Owner name:	EXXON CO USA,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	498		
Approved:	Not Reported	Installed:	8/25/1997 12:00:00 AM
Well depth:	108		
Water leve:	96		
Casing dep:	108		
Casing dia:	1		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	6/12/1997 12:00:00 AM	Site id:	AZ7000000028357

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ450**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028358**

Program:	55	Registry i:	563068
Owner name:	EXXON CO USA,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	498		
Approved:	Not Reported	Installed:	8/25/1997 12:00:00 AM
Well depth:	108		
Water leve:	96		
Casing dep:	108		
Casing dia:	1		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	6/12/1997 12:00:00 AM	Site id:	AZ7000000028358

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ461**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028359**

Program:	55	Registry i:	563069
Owner name:	EXXON CO USA,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	498		
Approved:	Not Reported	Installed:	8/25/1997 12:00:00 AM
Well depth:	108		
Water leve:	96		
Casing dep:	108		
Casing dia:	1		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	6/12/1997 12:00:00 AM	Site id:	AZ7000000028359

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ460**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028360**

Program:	55	Registry i:	563070
Owner name:	EXXON CO USA,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	498		
Approved:	Not Reported	Installed:	8/25/1997 12:00:00 AM
Well depth:	108		
Water leve:	96		
Casing dep:	108		
Casing dia:	1		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	6/12/1997 12:00:00 AM	Site id:	AZ7000000028360



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BQ459**

**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028361**

Program:	55	Registry i:	563071
Owner name:	EXXON CO USA,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	498		
Approved:	Not Reported	Installed:	8/25/1997 12:00:00 AM
Well depth:	108		
Water leve:	96		
Casing dep:	108		
Casing dia:	1		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	6/12/1997 12:00:00 AM	Site id:	AZ7000000028361

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BQ462**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028362**

Program:	55	Registry i:	563072
Owner name:	EXXON CO USA,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	498		
Approved:	Not Reported	Installed:	8/25/1997 12:00:00 AM
Well depth:	108		
Water leve:	96		
Casing dep:	108		
Casing dia:	1		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	6/12/1997 12:00:00 AM	Site id:	AZ7000000028362

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ465**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028363**

Program:	55	Registry i:	563073
Owner name:	EXXON CO USA,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	498		
Approved:	Not Reported	Installed:	7/11/1997 12:00:00 AM
Well depth:	115		
Water leve:	95		
Casing dep:	115		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	6/12/1997 12:00:00 AM	Site id:	AZ7000000028363

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ464**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028364**

Program:	55	Registry i:	563075
Owner name:	EXXON CO USA,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	498		
Approved:	Not Reported	Installed:	7/11/2097 12:00:00 AM
Well depth:	115		
Water leve:	95		
Casing dep:	115		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	6/12/1997 12:00:00 AM	Site id:	AZ7000000028364

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ463**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028365**

Program:	55	Registry i:	563076
Owner name:	EXXON CO USA,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	498		
Approved:	Not Reported	Installed:	7/11/1997 12:00:00 AM
Well depth:	115		
Water leve:	95		
Casing dep:	115		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	6/12/1997 12:00:00 AM	Site id:	AZ7000000028365

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ458**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028366**

Program:	55	Registry i:	563212
Owner name:	EXXON CO USA,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	498		
Approved:	Not Reported	Installed:	7/11/1997 12:00:00 AM
Well depth:	115		
Water leve:	95		
Casing dep:	115		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	6/23/1997 12:00:00 AM	Site id:	AZ7000000028366

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ453**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028367**

Program:	55	Registry i:	578849
Owner name:	EXXON COMPANY USA		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	78		
Approved:	1/4/2000 12:00:00 AM	Installed:	2/17/2000 12:00:00 AM
Well depth:	115		
Water leve:	95		
Casing dep:	115		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	12/29/1999 12:00:00 AM	Site id:	AZ7000000028367

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ452**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028368**

Program:	55	Registry i:	578850
Owner name:	EXXON COMPANY USA		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	78		
Approved:	1/4/2000 12:00:00 AM	Installed:	2/16/2000 12:00:00 AM
Well depth:	115		
Water leve:	95		
Casing dep:	115		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	12/29/1999 12:00:00 AM	Site id:	AZ7000000028368



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BQ451**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028369**

Program:	55	Registry i:	903275
Owner name:	EXXONMOBIL CORPORATION		
Rgr pump d:	NO	Welltype:	AIR SPARGING
Well type :	OTHER		
Dlic num:	78		
Approved:	10/7/2005 3:12:51 PM	Installed:	Not Reported
Well depth:	105		
Water leve:	89		
Casing dep:	85		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	10/7/2005 3:12:51 PM	Site id:	AZ7000000028369

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BQ454**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028370**

Program:	55	Registry i:	903276
Owner name:	EXXONMOBIL CORPORATION		
Rgr pump d:	NO	Welltype:	AIR SPARGING
Well type :	OTHER		
Dlic num:	78		
Approved:	10/7/2005 3:18:06 PM	Installed:	Not Reported
Well depth:	105		
Water leve:	89		
Casing dep:	85		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	10/7/2005 3:18:06 PM	Site id:	AZ7000000028370

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ457**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028371**

Program:	55	Registry i:	903277
Owner name:	EXXONMOBIL CORPORATION		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	78		
Approved:	10/7/2005 3:31:09 PM	Installed:	Not Reported
Well depth:	90		
Water leve:	89		
Casing dep:	87		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	10/7/2005 3:31:09 PM	Site id:	AZ7000000028371

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BQ456**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028372**

Program:	55	Registry i:	903279
Owner name:	EXXONMOBIL CORPORATION		
Rgr pump d:	NO	Welltype:	SOIL VAPOR EXTRACTION
Well type :	OTHER		
Dlic num:	78		
Approved:	10/7/2005 3:37:31 PM	Installed:	Not Reported
Well depth:	90		
Water leve:	0		
Casing dep:	87		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	10/7/2005 3:37:31 PM	Site id:	AZ7000000028372

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BQ455**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028373**

Program:	55	Registry i:	910065
Owner name:	EXXON MOBIL OIL CORPORATION		
Rgr pump d:	NO	Welltype:	AIR SPARGING
Well type :	OTHER		
Dlic num:	78		
Approved:	11/14/2008 2:38:09 PM	Installed:	11/19/2008 12:00:00 AM
Well depth:	102		
Water leve:	88		
Casing dep:	100		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013013ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503019.7		
Utm y mete:	3555188		
Applicatio:	11/14/2008 2:38:09 PM	Site id:	AZ7000000028373

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AP293**

**West**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028378**

Program:	55	Registry i:	618695
Owner name:	TUCSON, CITY OF		
Rgr pump d:	YES	Welltype:	NON-EXEMPT
Well type :	NON-EXEMPT		
Dlic num:	388		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	227		
Water leve:	107		
Casing dep:	227		
Casing dia:	16		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	124		
Testedrate:	124		
Draw down:	0		
Completion:	A	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15013013AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	13		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503422.7		
Utm y mete:	3555193		
Applicatio:	6/10/1982 12:00:00 AM	Site id:	AZ7000000028378

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

127  
WNW  
1/4 - 1/2 Mile  
Lower

AZ WELLS AZ7000000028382

Program:	55	Registry i:	561055
Owner name:	TUCSON, CITY OF,		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	272		
Approved:	Not Reported	Installed:	3/4/1997 12:00:00 AM
Well depth:	170		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BBA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504026.7		
Utm y mete:	3555196		
Applicatio:	1/22/1997 12:00:00 AM	Site id:	AZ7000000028382

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**V152**  
**West**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028383**

Program:	55	Registry i:	619892
Owner name:	TUCSON, CITY OF,		
Rgr pump d:	YES	Welltype:	NON-EXEMPT
Well type :	NON-EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	4/1/1964 12:00:00 AM
Well depth:	1000		
Water leve:	229		
Casing dep:	1000		
Casing dia:	16		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	337		
Testedrate:	337		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018BBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.3		
Utm y mete:	3555196		
Applicatio:	6/9/1982 12:00:00 AM	Site id:	AZ7000000028383



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**N112**  
**WNW**  
**1/4 - 1/2 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028385**

Program:	55	Registry i:	214445
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	1/23/2007 12:00:00 AM	Installed:	7/16/2007 12:00:00 AM
Well depth:	103		
Water leve:	82		
Casing dep:	102		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504228.1		
Utm y mete:	3555197		
Applicatio:	1/9/2007 12:00:00 AM	Site id:	AZ7000000028385

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**N111**  
**WNW**  
**1/4 - 1/2 Mile**  
**Lower**

**AZ WELLS** **AZ7000000028386**

Program:	55	Registry i:	214446
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	1/23/2007 12:00:00 AM	Installed:	7/26/2007 12:00:00 AM
Well depth:	107		
Water leve:	82		
Casing dep:	105		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504228.1		
Utm y mete:	3555197		
Applicatio:	1/9/2007 12:00:00 AM	Site id:	AZ7000000028386

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**N110**  
**WNW**  
**1/4 - 1/2 Mile**  
**Lower**

**AZ WELLS AZ7000000028387**

Program:	55	Registry i:	214447
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	1/23/2007 12:00:00 AM	Installed:	7/16/2007 12:00:00 AM
Well depth:	157		
Water leve:	80		
Casing dep:	155		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504228.1		
Utm y mete:	3555197		
Applicatio:	1/9/2007 12:00:00 AM	Site id:	AZ7000000028387

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**N115**  
**WNW**  
**1/4 - 1/2 Mile**  
**Lower**

**AZ WELLS** **AZ7000000028388**

Program:	55	Registry i:	214448
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	1/23/2007 12:00:00 AM	Installed:	7/19/2007 12:00:00 AM
Well depth:	152		
Water leve:	82		
Casing dep:	150		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504228.1		
Utm y mete:	3555197		
Applicatio:	1/9/2007 12:00:00 AM	Site id:	AZ7000000028388

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**N114**  
**WNW**  
**1/4 - 1/2 Mile**  
**Lower**

**AZ WELLS AZ7000000028389**

Program:	55	Registry i:	214363
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	1/23/2007 12:00:00 AM	Installed:	8/3/2007 12:00:00 AM
Well depth:	105		
Water leve:	82		
Casing dep:	102		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504228.1		
Utm y mete:	3555197		
Applicatio:	1/9/2007 12:00:00 AM	Site id:	AZ7000000028389

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**N113**  
**WNW**  
**1/4 - 1/2 Mile**  
**Lower**

**AZ WELLS** **AZ7000000028390**

Program:	55	Registry i:	214364
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	1/23/2007 12:00:00 AM	Installed:	8/2/2007 12:00:00 AM
Well depth:	153		
Water leve:	82		
Casing dep:	150		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504228.1		
Utm y mete:	3555197		
Applicatio:	1/9/2007 12:00:00 AM	Site id:	AZ7000000028390

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**M107**  
**ENE**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028391**

Program:	55	Registry i:	521448
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	498		
Approved:	Not Reported	Installed:	6/22/1988 12:00:00 AM
Well depth:	125		
Water leve:	98		
Casing dep:	121		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018AAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	505234.3		
Utm y mete:	3555198		
Applicatio:	6/13/1988 12:00:00 AM	Site id:	AZ7000000028391

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**M106**  
**ENE**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028392**

Program:	55	Registry i:	521449
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	498		
Approved:	Not Reported	Installed:	6/24/1988 12:00:00 AM
Well depth:	111		
Water leve:	98		
Casing dep:	108		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018AAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	505234.3		
Utm y mete:	3555198		
Applicatio:	6/13/1988 12:00:00 AM	Site id:	AZ7000000028392



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**M109**

**ENE**

**1/4 - 1/2 Mile  
Higher**

**AZ WELLS**

**AZ7000000028393**

Program:	55	Registry i:	521450
Owner name:	HUDGIN AIR SERVICE,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	263		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018AAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	505234.3		
Utm y mete:	3555198		
Applicatio:	6/13/1988 12:00:00 AM	Site id:	AZ7000000028393

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**M108**  
**ENE**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS** **AZ7000000028394**

Program:	55	Registry i:	521451
Owner name:	HUDGIN AIR SERVICE,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	263		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018AAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	505234.3		
Utm y mete:	3555198		
Applicatio:	6/13/1988 12:00:00 AM	Site id:	AZ7000000028394

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**E39**  
**NE**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS AZ7000000028395**

Program:	55	Registry i:	523730
Owner name:	AZ ANG,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	4/26/1989 12:00:00 AM
Well depth:	101		
Water leve:	0		
Casing dep:	101		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033		
Utm y mete:	3555198		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028395

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**E38**  
**NE**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS AZ7000000028396**

Program:	55	Registry i:	523731
Owner name:	AZ ANG,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	5/1/1989 12:00:00 AM
Well depth:	117		
Water leve:	0		
Casing dep:	117		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033		
Utm y mete:	3555198		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028396

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**E41**  
**NE**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028397**

Program:	55	Registry i:	523732
Owner name:	AZ ANG,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	4/30/1989 12:00:00 AM
Well depth:	140		
Water leve:	85		
Casing dep:	138		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033		
Utm y mete:	3555198		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028397

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**E40**  
**NE**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS AZ7000000028398**

Program:	55	Registry i:	523733
Owner name:	AZ ANG,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	5/2/1989 12:00:00 AM
Well depth:	158		
Water leve:	0		
Casing dep:	158		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033		
Utm y mete:	3555198		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028398

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**E35**  
**NE**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS AZ7000000028399**

Program:	55	Registry i:	523734
Owner name:	AZ ANG,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	4/30/1989 12:00:00 AM
Well depth:	104		
Water leve:	0		
Casing dep:	104		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033		
Utm y mete:	3555198		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028399

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**E34**

**NE**

**1/8 - 1/4 Mile  
Higher**

**AZ WELLS**

**AZ7000000028400**

Program:	55	Registry i:	523738
Owner name:	AZ ANG,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	5/18/1989 12:00:00 AM
Well depth:	138		
Water leve:	0		
Casing dep:	135		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033		
Utm y mete:	3555198		
Applicatio:	3/22/1989 12:00:00 AM	Site id:	AZ7000000028400



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**E37**  
**NE**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS AZ7000000028401**

Program:	55	Registry i:	523748
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	83		
Approved:	Not Reported	Installed:	5/22/1989 12:00:00 AM
Well depth:	110		
Water leve:	0		
Casing dep:	110		
Casing dia:	6		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033		
Utm y mete:	3555198		
Applicatio:	3/22/1989 12:00:00 AM	Site id:	AZ7000000028401

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**E36**  
**NE**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS AZ7000000028402**

Program:	55	Registry i:	558690
Owner name:	AZ AIR NAT'L GUARD,		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	22		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033		
Utm y mete:	3555198		
Applicatio:	7/2/1996 12:00:00 AM	Site id:	AZ7000000028402

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**E42**

**NE**

**1/8 - 1/4 Mile  
Higher**

**AZ WELLS**

**AZ7000000028403**

Program:	55	Registry i:	558691
Owner name:	AZ AIR NAT'L GUARD		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	22		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033		
Utm y mete:	3555198		
Applicatio:	7/2/1996 12:00:00 AM	Site id:	AZ7000000028403

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**E48**

**NE**

**1/8 - 1/4 Mile  
Higher**

**AZ WELLS**

**AZ7000000028404**

Program:	55	Registry i:	558692
Owner name:	AZ AIR NAT'L GUARD		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	22		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033		
Utm y mete:	3555198		
Applicatio:	7/2/1996 12:00:00 AM	Site id:	AZ7000000028404

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

E47

NE

1/8 - 1/4 Mile  
Higher

AZ WELLS

AZ7000000028405

Program:	55	Registry i:	558693
Owner name:	AZ AIR NAT'L GUARD		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	22		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033		
Utm y mete:	3555198		
Applicatio:	7/2/1996 12:00:00 AM	Site id:	AZ7000000028405

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**E50**  
**NE**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS** **AZ7000000028406**

Program:	55	Registry i:	558694
Owner name:	AZ AIR NAT'L GUARD		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	22		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033		
Utm y mete:	3555198		
Applicatio:	7/2/1996 12:00:00 AM	Site id:	AZ7000000028406

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**E49**  
**NE**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS AZ7000000028407**

Program:	55	Registry i:	569761
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	PIEZOMETER
Well type :	MONITOR		
Dlic num:	161		
Approved:	8/5/1998 12:00:00 AM	Installed:	8/12/1998 12:00:00 AM
Well depth:	106		
Water leve:	76		
Casing dep:	103		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033		
Utm y mete:	3555198		
Applicatio:	7/16/1998 12:00:00 AM	Site id:	AZ7000000028407

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**E44**  
**NE**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028408**

Program:	55	Registry i:	579747
Owner name:	AIR NATIONAL GUARD 162 FW/EM		
Rgr pump d:	NO	Welltype:	GEOTECHNICAL
Well type :	OTHER		
Dlic num:	498		
Approved:	3/3/2000 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014018AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033		
Utm y mete:	3555198		
Applicatio:	2/24/2000 12:00:00 AM	Site id:	AZ7000000028408



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**E43**

**NE**

**1/8 - 1/4 Mile  
Higher**

**AZ WELLS**

**AZ7000000028409**

Program:	55	Registry i:	579748
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	3/27/2000 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	N	Cadastral:	D15014018AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033		
Utm y mete:	3555198		
Applicatio:	2/24/2000 12:00:00 AM	Site id:	AZ7000000028409

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**E46**

**NE**

**1/8 - 1/4 Mile  
Higher**

**AZ WELLS**

**AZ7000000028410**

Program:	55	Registry i:	579749
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	3/27/2000 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	N	Cadastral:	D15014018AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033		
Utm y mete:	3555198		
Applicatio:	2/24/2000 12:00:00 AM	Site id:	AZ7000000028410

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**E45**  
**NE**  
**1/8 - 1/4 Mile**  
**Higher**

**AZ WELLS AZ7000000028411**

Program:	55	Registry i:	579750
Owner name:	AIR NATIONAL GUARD 162 FW/EM		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	83		
Approved:	3/27/2000 12:00:00 AM	Installed:	Not Reported
Well depth:	100		
Water leve:	86		
Casing dep:	100		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	N	Cadastral:	D15014018AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505033		
Utm y mete:	3555198		
Applicatio:	2/24/2000 12:00:00 AM	Site id:	AZ7000000028411

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**C14**  
**NNE**  
**0 - 1/8 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028412**

Program:	55	Registry i:	523739
Owner name:	AZ ANG,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	5/19/1989 12:00:00 AM
Well depth:	138		
Water leve:	0		
Casing dep:	138		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ABA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504831.7		
Utm y mete:	3555198		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028412

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**C13**  
**NNE**  
**0 - 1/8 Mile**  
**Lower**

**AZ WELLS AZ7000000028413**

Program:	55	Registry i:	523740
Owner name:	AZ ANG,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	5/16/1989 12:00:00 AM
Well depth:	103		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ABA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504831.7		
Utm y mete:	3555198		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028413

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**C16**  
**NNE**  
**0 - 1/8 Mile**  
**Lower**

**AZ WELLS AZ7000000028414**

Program:	55	Registry i:	523741
Owner name:	AZ ANG,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	4/27/1989 12:00:00 AM
Well depth:	148		
Water leve:	0		
Casing dep:	137		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ABA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504831.7		
Utm y mete:	3555198		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028414

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**C15**  
**NNE**  
**0 - 1/8 Mile**  
**Lower**

**AZ WELLS AZ7000000028415**

Program:	55	Registry i:	523742
Owner name:	AZ ANG,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	4/27/1989 12:00:00 AM
Well depth:	102		
Water leve:	0		
Casing dep:	102		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ABA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504831.7		
Utm y mete:	3555198		
Applicatio:	2/28/1989 12:00:00 AM	Site id:	AZ7000000028415

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**D23**

**NW**

**1/8 - 1/4 Mile  
Lower**

**AZ WELLS**

**AZ7000000028416**

Program:	55	Registry i:	525126
Owner name:	AZ AIR NATL GUARD,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	9/22/1989 12:00:00 AM
Well depth:	108		
Water leve:	92		
Casing dep:	107		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504630.5		
Utm y mete:	3555198		
Applicatio:	6/12/1989 12:00:00 AM	Site id:	AZ7000000028416



## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database      EDR ID Number

**D24**  
**NW**  
**1/8 - 1/4 Mile**  
**Lower**

**AZ WELLS      AZ7000000028417**

Program:	55	Registry i:	524694
Owner name:	AZ AIR NATL GUARD,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	314		
Approved:	Not Reported	Installed:	10/13/1989 12:00:00 AM
Well depth:	200		
Water leve:	90		
Casing dep:	132		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504630.5		
Utm y mete:	3555198		
Applicatio:	5/26/1989 12:00:00 AM	Site id:	AZ7000000028417

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**D22**

**NW**

**1/8 - 1/4 Mile  
Lower**

**AZ WELLS**

**AZ7000000028418**

Program:	55	Registry i:	552219
Owner name:	AZ AIR NATL GUARD,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	269		
Approved:	Not Reported	Installed:	11/29/1995 12:00:00 AM
Well depth:	100		
Water leve:	84		
Casing dep:	97		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504630.5		
Utm y mete:	3555198		
Applicatio:	9/21/1995 12:00:00 AM	Site id:	AZ7000000028418

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**D20**  
**NW**  
**1/8 - 1/4 Mile**  
**Lower**

**AZ WELLS AZ7000000028419**

Program:	55	Registry i:	552222
Owner name:	AZ AIR NATL GUARD,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	269		
Approved:	Not Reported	Installed:	11/28/1995 12:00:00 AM
Well depth:	135		
Water leve:	84		
Casing dep:	130		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504630.5		
Utm y mete:	3555198		
Applicatio:	9/21/1995 12:00:00 AM	Site id:	AZ7000000028419

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**D21**  
**NW**  
**1/8 - 1/4 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028420**

Program:	55	Registry i:	558676
Owner name:	AZ AIR NAT'L GUARD,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	22		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504630.5		
Utm y mete:	3555198		
Applicatio:	7/2/1996 12:00:00 AM	Site id:	AZ7000000028420

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**D25**  
**NW**  
**1/8 - 1/4 Mile**  
**Lower**

**AZ WELLS AZ7000000028421**

Program:	55	Registry i:	558679
Owner name:	AZ AIR NAT'L GUARD,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	22		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504630.5		
Utm y mete:	3555198		
Applicatio:	7/2/1996 12:00:00 AM	Site id:	AZ7000000028421

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**D29**

**NW**

**1/8 - 1/4 Mile  
Lower**

**AZ WELLS**

**AZ7000000028422**

Program:	55	Registry i:	558682
Owner name:	AZ AIR NAT'L GUARD,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	22		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504630.5		
Utm y mete:	3555198		
Applicatio:	7/2/1996 12:00:00 AM	Site id:	AZ7000000028422

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**D30**  
**NW**  
**1/8 - 1/4 Mile**  
**Lower**

**AZ WELLS AZ7000000028423**

Program:	55	Registry i:	558685
Owner name:	AZ AIR NAT'L GUARD		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	22		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR < 1 HP		
Pumprate:	45		
Testedrate:	8		
Draw down:	6		
Completion:	X	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504630.5		
Utm y mete:	3555198		
Applicatio:	7/2/1996 12:00:00 AM	Site id:	AZ7000000028423

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**D28**  
**NW**  
**1/8 - 1/4 Mile**  
**Lower**

**AZ WELLS AZ7000000028424**

Program:	55	Registry i:	558686
Owner name:	AZ AIR NAT'L GUARD,		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	22		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014018ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504630.5		
Utm y mete:	3555198		
Applicatio:	7/2/1996 12:00:00 AM	Site id:	AZ7000000028424



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**D26**  
**NW**  
**1/8 - 1/4 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028425**

Program:	55	Registry i:	569762
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	PIEZOMETER
Well type :	MONITOR		
Dlic num:	161		
Approved:	8/5/1998 12:00:00 AM	Installed:	8/9/1998 12:00:00 AM
Well depth:	138		
Water leve:	81		
Casing dep:	135		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504630.5		
Utm y mete:	3555198		
Applicatio:	7/16/1998 12:00:00 AM	Site id:	AZ7000000028425

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**D27**  
**NW**  
**1/8 - 1/4 Mile**  
**Lower**

**AZ WELLS AZ7000000028426**

Program:	55	Registry i:	569764
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	PIEZOMETER
Well type :	MONITOR		
Dlic num:	161		
Approved:	8/5/1998 12:00:00 AM	Installed:	8/14/1998 12:00:00 AM
Well depth:	145		
Water leve:	87		
Casing dep:	144		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504630.5		
Utm y mete:	3555198		
Applicatio:	7/16/1998 12:00:00 AM	Site id:	AZ7000000028426

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**H66**  
**WNW**  
**1/8 - 1/4 Mile**  
**Lower**

**AZ WELLS AZ7000000028427**

Program:	55	Registry i:	552217
Owner name:	AZ AIR NATL GUARD,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	269		
Approved:	Not Reported	Installed:	11/16/1995 12:00:00 AM
Well depth:	100		
Water leve:	83		
Casing dep:	97		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.2		
Utm y mete:	3555198		
Applicatio:	9/21/1995 12:00:00 AM	Site id:	AZ7000000028427

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**H65**  
**WNW**  
**1/8 - 1/4 Mile**  
**Lower**

**AZ WELLS** **AZ7000000028428**

Program:	55	Registry i:	552218
Owner name:	AZ AIR NATL GUARD,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	269		
Approved:	Not Reported	Installed:	11/15/1995 12:00:00 AM
Well depth:	145		
Water leve:	83		
Casing dep:	140		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.2		
Utm y mete:	3555198		
Applicatio:	9/21/1995 12:00:00 AM	Site id:	AZ7000000028428

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**H64**  
**WNW**  
**1/8 - 1/4 Mile**  
**Lower**

**AZ WELLS** **AZ7000000028429**

Program:	55	Registry i:	552220
Owner name:	AZ AIR NATL GUARD,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	269		
Approved:	Not Reported	Installed:	11/22/1995 12:00:00 AM
Well depth:	100		
Water leve:	83		
Casing dep:	97		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.2		
Utm y mete:	3555198		
Applicatio:	9/21/1995 12:00:00 AM	Site id:	AZ7000000028429

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**H69**  
**WNW**  
**1/8 - 1/4 Mile**  
**Lower**

**AZ WELLS** **AZ7000000028430**

Program:	55	Registry i:	552221
Owner name:	AZ AIR NATL GUARD,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	269		
Approved:	Not Reported	Installed:	11/21/1995 12:00:00 AM
Well depth:	140		
Water leve:	83		
Casing dep:	130		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.2		
Utm y mete:	3555198		
Applicatio:	9/21/1995 12:00:00 AM	Site id:	AZ7000000028430

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**H68**  
**WNW**  
**1/8 - 1/4 Mile**  
**Lower**

**AZ WELLS AZ7000000028431**

Program:	55	Registry i:	594004
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	78		
Approved:	8/14/2002 12:00:00 AM	Installed:	8/23/2002 12:00:00 AM
Well depth:	105		
Water leve:	0		
Casing dep:	105		
Casing dia:	8		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR 1 - 5 HP		
Pumprate:	7		
Testedrate:	7		
Draw down:	17		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.2		
Utm y mete:	3555198		
Applicatio:	8/7/2002 12:00:00 AM	Site id:	AZ7000000028431

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**H67**  
**WNW**  
**1/8 - 1/4 Mile**  
**Lower**

**AZ WELLS AZ7000000028432**

Program:	55	Registry i:	594005
Owner name:	ARIZONA AIR NATIONAL GUARD		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	78		
Approved:	8/16/2002 12:00:00 AM	Installed:	8/29/2002 12:00:00 AM
Well depth:	104		
Water leve:	0		
Casing dep:	104		
Casing dia:	15		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR < 1 HP		
Pumprate:	7		
Testedrate:	5		
Draw down:	10		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014018BAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	18		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.2		
Utm y mete:	3555198		
Applicatio:	8/7/2002 12:00:00 AM	Site id:	AZ7000000028432



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AC190**

**East  
1/2 - 1 Mile  
Higher**

**AZ WELLS**

**AZ7000000028433**

Program:	55	Registry i:	527758
Owner name:	BURR-BROWN CORP,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	YES		
Well type :	MONITOR		
Dlic num:	342		
Approved:	Not Reported	Installed:	6/14/1990 12:00:00 AM
Well depth:	151		
Water leve:	114		
Casing dep:	146		
Casing dia:	6		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505845.9		
Utm y mete:	3555199		
Applicatio:	4/16/1990 12:00:00 AM	Site id:	AZ7000000028433

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AC189**

**East  
1/2 - 1 Mile  
Higher**

**AZ WELLS**

**AZ7000000028434**

Program:	55	Registry i:	527789
Owner name:	E MEDINA PARTNERS,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	533		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014017BAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505845.9		
Utm y mete:	3555199		
Applicatio:	4/17/1990 12:00:00 AM	Site id:	AZ7000000028434

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AC192**  
**East**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS** **AZ7000000028435**

Program:	55	Registry i:	527790
Owner name:	E MEDINA PARTNERS,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	533		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014017BAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505845.9		
Utm y mete:	3555199		
Applicatio:	4/17/1990 12:00:00 AM	Site id:	AZ7000000028435

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AC191**

**East  
1/2 - 1 Mile  
Higher**

**AZ WELLS**

**AZ7000000028436**

Program:	55	Registry i:	527791
Owner name:	E MEDINA PARTNERS,	Welltype:	EXPLORATION
Rgr pump d:	NO		
Well type :	OTHER		
Dlic num:	533		
Approved:	Not Reported	Installed:	5/7/1990 12:00:00 AM
Well depth:	150		
Water leve:	105		
Casing dep:	125		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014017BAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505845.9		
Utm y mete:	3555199		
Applicatio:	4/17/1990 12:00:00 AM	Site id:	AZ7000000028436

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**T144**  
**ENE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028437**

Program:	55	Registry i:	400122
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	498		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	A	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014017BBA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	505641.5		
Utm y mete:	3555199		
Applicatio:	9/17/1999 12:00:00 AM	Site id:	AZ7000000028437

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

125  
ENE  
1/4 - 1/2 Mile  
Higher

AZ WELLS AZ7000000028438

Program:	55	Registry i:	481801
Owner name:	TUCSON AIRPORT AUTHORITY		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	498		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	70		
Water leve:	0		
Casing dep:	70		
Casing dia:	8		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014017BBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505437		
Utm y mete:	3555199		
Applicatio:	8/4/2004 12:00:00 AM	Site id:	AZ7000000028438

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BB338**

**East  
1/2 - 1 Mile  
Higher**

**AZ WELLS**

**AZ7000000028439**

Program:	55	Registry i:	801457
Owner name:	RED HAWK MARANA LLC,		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	140		
Casing dep:	0		
Casing dia:	6		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	35		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014017ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	506254.6		
Utm y mete:	3555200		
Applicatio:	4/16/1984 12:00:00 AM	Site id:	AZ7000000028439

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BB339**

**East  
1/2 - 1 Mile  
Higher**

**AZ WELLS**

**AZ7000000028440**

Program:	55	Registry i:	801459
Owner name:	RED HAWK MARANA LLC,		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	140		
Casing dep:	0		
Casing dia:	6		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	35		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014017ABB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	506254.6		
Utm y mete:	3555200		
Applicatio:	4/16/1984 12:00:00 AM	Site id:	AZ7000000028440



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

510  
East  
1 - 2 Miles  
Higher

AZ WELLS AZ7000000028442

Program:	55	Registry i:	630051
Owner name:	VALLEY INDUSTRIAL PK		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014017AAB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	17		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	506663.2		
Utm y mete:	3555201		
Applicatio:	7/16/1982 12:00:00 AM	Site id:	AZ7000000028442

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**530**  
**West**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028505**

Program:	55	Registry i:	561054
Owner name:	TUCSON, CITY OF,	Welltype:	EXPLORATION
Rgr pump d:	NO		
Well type :	OTHER		
Dlic num:	272		
Approved:	Not Reported	Installed:	3/18/1997 12:00:00 AM
Well depth:	170		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013012CDD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	502818.8		
Utm y mete:	3555390		
Applicatio:	1/22/1997 12:00:00 AM	Site id:	AZ7000000028505

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BT473**  
**WNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028506**

Program:	55	Registry i:	209002
Owner name:	CONOCO PHILLIPS COMPANY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	78		
Approved:	8/25/2005 12:00:00 AM	Installed:	8/30/2005 12:00:00 AM
Well depth:	115		
Water leve:	93		
Casing dep:	110		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013012DCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503020.3		
Utm y mete:	3555392		
Applicatio:	8/15/2005 12:00:00 AM	Site id:	AZ7000000028506

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BT474**  
**WNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028507**

Program:	55	Registry i:	209003
Owner name:	CONOCO PHILLIPS COMPANY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	78		
Approved:	8/17/2005 12:00:00 AM	Installed:	Not Reported
Well depth:	115		
Water leve:	91		
Casing dep:	110		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013012DCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503020.3		
Utm y mete:	3555392		
Applicatio:	8/15/2005 12:00:00 AM	Site id:	AZ7000000028507

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BT472**  
**WNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028508**

Program:	55	Registry i:	209004
Owner name:	CONOCO PHILLIPS COMPANY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	78		
Approved:	8/25/2005 12:00:00 AM	Installed:	9/1/2005 12:00:00 AM
Well depth:	115		
Water leve:	91		
Casing dep:	110		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013012DCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503020.3		
Utm y mete:	3555392		
Applicatio:	8/15/2005 12:00:00 AM	Site id:	AZ7000000028508

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BT470**  
**WNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028509**

Program:	55	Registry i:	209005
Owner name:	CONOCO PHILLIPS COMPANY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	78		
Approved:	8/25/2005 12:00:00 AM	Installed:	9/7/2005 12:00:00 AM
Well depth:	115		
Water leve:	92		
Casing dep:	110		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013012DCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503020.3		
Utm y mete:	3555392		
Applicatio:	8/15/2005 12:00:00 AM	Site id:	AZ7000000028509

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BT471**  
**WNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028510**

Program:	55	Registry i:	214555
Owner name:	CONOCO PHILLIPS COMPANY		
Rgr pump d:	NO	Welltype:	AIR SPARGING
Well type :	OTHER		
Dlic num:	78		
Approved:	2/5/2007 12:00:00 AM	Installed:	5/9/2007 12:00:00 AM
Well depth:	106		
Water leve:	80		
Casing dep:	105		
Casing dia:	3		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013012DCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503020.3		
Utm y mete:	3555392		
Applicatio:	1/19/2007 12:00:00 AM	Site id:	AZ7000000028510

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BT475**  
**WNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS** **AZ7000000028511**

Program:	55	Registry i:	214556
Owner name:	CONOCO PHILLIPS COMPANY		
Rgr pump d:	NO	Welltype:	AIR SPARGING
Well type :	OTHER		
Dlic num:	78		
Approved:	2/5/2007 12:00:00 AM	Installed:	5/8/2007 12:00:00 AM
Well depth:	106		
Water leve:	80		
Casing dep:	105		
Casing dia:	3		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013012DCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503020.3		
Utm y mete:	3555392		
Applicatio:	1/19/2007 12:00:00 AM	Site id:	AZ7000000028511



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BT479**  
**WNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028512**

Program:	55	Registry i:	214557
Owner name:	CONOCO PHILLIPS COMPANY		
Rgr pump d:	NO	Welltype:	AIR SPARGING
Well type :	OTHER		
Dlic num:	78		
Approved:	2/5/2007 12:00:00 AM	Installed:	5/7/2007 12:00:00 AM
Well depth:	106		
Water leve:	80		
Casing dep:	105		
Casing dia:	3		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013012DCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503020.3		
Utm y mete:	3555392		
Applicatio:	1/19/2007 12:00:00 AM	Site id:	AZ7000000028512

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BT480**  
**WNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS** **AZ7000000028513**

Program:	55	Registry i:	214558
Owner name:	CONOCO PHILLIPS COMPANY		
Rgr pump d:	NO	Welltype:	AIR SPARGING
Well type :	OTHER		
Dlic num:	78		
Approved:	Not Reported	Installed:	5/10/2007 12:00:00 AM
Well depth:	106		
Water leve:	80		
Casing dep:	105		
Casing dia:	3		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013012DCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503020.3		
Utm y mete:	3555392		
Applicatio:	1/19/2007 12:00:00 AM	Site id:	AZ7000000028513

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BT478**  
**WNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028514**

Program:	55	Registry i:	563074
Owner name:	EXXON MOBIL OIL CORPORATION		
Rgr pump d:	NO	Welltype:	MONITOR OR PIEZOMETER
Well type :	MONITOR		
Dlic num:	498		
Approved:	Not Reported	Installed:	7/11/1997 12:00:00 AM
Well depth:	115		
Water leve:	95		
Casing dep:	115		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	A	Drill log:	X
Well cance:	Y	Cadastral:	D15013012DCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503020.3		
Utm y mete:	3555392		
Applicatio:	6/12/1997 12:00:00 AM	Site id:	AZ7000000028514

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BT476**  
**WNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028515**

Program:	55	Registry i:	588874
Owner name:	EXXON MOBIL OIL CORPORATION		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	78		
Approved:	9/19/2001 12:00:00 AM	Installed:	10/24/2001 12:00:00 AM
Well depth:	115		
Water leve:	90		
Casing dep:	80		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013012DCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503020.3		
Utm y mete:	3555392		
Applicatio:	9/12/2001 12:00:00 AM	Site id:	AZ7000000028515

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BT477**  
**WNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028516**

Program:	55	Registry i:	902504
Owner name:	CONOCO PHILLIPS COMPANY		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	78		
Approved:	6/22/2005 12:52:00 PM	Installed:	Not Reported
Well depth:	110		
Water leve:	90		
Casing dep:	110		
Casing dia:	3		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013012DCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503020.3		
Utm y mete:	3555392		
Applicatio:	6/22/2005 12:52:00 PM	Site id:	AZ7000000028516

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**S139**  
**WNW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS AZ7000000028526**

Program:	55	Registry i:	505567
Owner name:	TUCSON WATER		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	22		
Approved:	Not Reported	Installed:	11/18/1983 12:00:00 AM
Well depth:	377		
Water leve:	209		
Casing dep:	372		
Casing dia:	6		
Casing typ:	PLASTIC OR PVC		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR 1 - 5 HP		
Pumprate:	56		
Testedrate:	56		
Draw down:	111		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014007CCD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504027.1		
Utm y mete:	3555399		
Applicatio:	6/8/1983 12:00:00 AM	Site id:	AZ7000000028526

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**S140**  
**WNW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028527**

Program:	55	Registry i:	505568
Owner name:	TUCSON WATER		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	22		
Approved:	Not Reported	Installed:	11/20/1983 12:00:00 AM
Well depth:	235		
Water leve:	100		
Casing dep:	213		
Casing dia:	6		
Casing typ:	PLASTIC OR PVC		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR 1 - 5 HP		
Pumprate:	26		
Testedrate:	26		
Draw down:	59		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014007CCD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504027.1		
Utm y mete:	3555399		
Applicatio:	6/8/1983 12:00:00 AM	Site id:	AZ7000000028527

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**S141**  
**WNW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028528**

Program:	55	Registry i:	531357
Owner name:	SOUTHWEST GAS CORP,		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	499		
Approved:	Not Reported	Installed:	4/10/1991 12:00:00 AM
Well depth:	228		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014007CCD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504027.1		
Utm y mete:	3555399		
Applicatio:	3/25/1991 12:00:00 AM	Site id:	AZ7000000028528



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**J94**  
**NNW**  
**1/4 - 1/2 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028529**

Program:	55	Registry i:	507246
Owner name:	TUCSON WATER		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	342		
Approved:	Not Reported	Installed:	7/2/1984 12:00:00 AM
Well depth:	194		
Water leve:	86		
Casing dep:	190		
Casing dia:	16		
Casing typ:	PLASTIC OR PVC		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR 1 - 5 HP		
Pumprate:	53		
Testedrate:	53		
Draw down:	17		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014007DCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	504630.7		
Utm y mete:	3555400		
Applicatio:	2/17/1984 12:00:00 AM	Site id:	AZ7000000028529

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**J95**  
**NNW**  
**1/4 - 1/2 Mile**  
**Lower**

**AZ WELLS AZ7000000028530**

Program:	55	Registry i:	575686
Owner name:	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY/SUPERFUND DIV		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	611		
Approved:	7/1/1999 12:00:00 AM	Installed:	7/13/1999 12:00:00 AM
Well depth:	140		
Water leve:	88		
Casing dep:	100		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014007DCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	504630.7		
Utm y mete:	3555400		
Applicatio:	6/18/1999 12:00:00 AM	Site id:	AZ7000000028530

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

286  
ENE  
1/2 - 1 Mile  
Higher

AZ WELLS

AZ7000000028531

Program:	55	Registry i:	517952
Owner name:	WATER RESOURCES,		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	263		
Approved:	Not Reported	Installed:	6/25/1987 12:00:00 AM
Well depth:	141		
Water leve:	135		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Y	Cadastral:	D15014008CDD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	8		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	506051.3		
Utm y mete:	3555402		
Applicatio:	6/1/1987 12:00:00 AM	Site id:	AZ7000000028531

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BZ496**  
**WNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS** **AZ7000000028567**

Program:	55	Registry i:	218694
Owner name:	QWEST CORPORATION		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	78		
Approved:	2/3/2009 12:00:00 AM	Installed:	2/25/2009 12:00:00 AM
Well depth:	115		
Water leve:	96		
Casing dep:	115		
Casing dia:	2		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013012DCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503020.4		
Utm y mete:	3555595		
Applicatio:	1/28/2009 12:00:00 AM	Site id:	AZ7000000028567

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BZ495**  
**WNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS** **AZ7000000028568**

Program:	55	Registry i:	555009
Owner name:	US WEST COMMUNICATNS,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	83		
Approved:	Not Reported	Installed:	3/19/1996 12:00:00 AM
Well depth:	122		
Water leve:	100		
Casing dep:	120		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013012DCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503020.4		
Utm y mete:	3555595		
Applicatio:	2/2/1996 12:00:00 AM	Site id:	AZ7000000028568

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BZ497**  
**WNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028569**

Program:	55	Registry i:	555010
Owner name:	US WEST COMMUNICATNS,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	83		
Approved:	Not Reported	Installed:	3/20/1996 12:00:00 AM
Well depth:	120		
Water leve:	100		
Casing dep:	120		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013012DCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503020.4		
Utm y mete:	3555595		
Applicatio:	2/2/1996 12:00:00 AM	Site id:	AZ7000000028569

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BZ499**  
**WNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028570**

Program:	55	Registry i:	555011
Owner name:	US WEST COMMUNICATNS,	Welltype:	MONITOR OR PIEZOMETER
Rgr pump d:	NO		
Well type :	MONITOR		
Dlic num:	83		
Approved:	Not Reported	Installed:	3/28/1996 12:00:00 AM
Well depth:	120		
Water leve:	100		
Casing dep:	120		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013012DCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503020.4		
Utm y mete:	3555595		
Applicatio:	2/2/1996 12:00:00 AM	Site id:	AZ7000000028570

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BZ498**  
**WNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS** **AZ7000000028571**

Program:	55	Registry i:	638733
Owner name:	MICHAELSON,J		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	5/16/1958 12:00:00 AM
Well depth:	150		
Water leve:	0		
Casing dep:	0		
Casing dia:	8		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	25		
Testedrate:	25		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013012DCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503020.4		
Utm y mete:	3555595		
Applicatio:	6/4/1982 12:00:00 AM	Site id:	AZ7000000028571



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

197  
WNW  
1/2 - 1 Mile  
Lower

AZ WELLS

AZ7000000028573

Program:	55	Registry i:	801310
Owner name:	PARK MANOR MOBILE PK,	Welltype:	EXEMPT
Rgr pump d:	NO		
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	1/1/1956 12:00:00 AM
Well depth:	225		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	28		
Testedrate:	28		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014007CCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.7		
Utm y mete:	3555601		
Applicatio:	2/21/1984 12:00:00 AM	Site id:	AZ7000000028573

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

123

NNE

1/4 - 1/2 Mile  
Higher

AZ WELLS

AZ7000000028574

Program:	55	Registry i:	568106
Owner name:	US EPA REGION 9		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	611		
Approved:	4/17/1998 12:00:00 AM	Installed:	5/12/1998 12:00:00 AM
Well depth:	140		
Water leve:	76		
Casing dep:	75		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014007DDB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505032.8		
Utm y mete:	3555602		
Applicatio:	4/10/1998 12:00:00 AM	Site id:	AZ7000000028574

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**120**  
**North**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028575**

Program:	55	Registry i:	568109
Owner name:	US EPA REGION 9		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	611		
Approved:	4/17/1998 12:00:00 AM	Installed:	12/31/1998 12:00:00 AM
Well depth:	120		
Water leve:	0		
Casing dep:	85		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014007DCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504831.7		
Utm y mete:	3555602		
Applicatio:	4/10/1998 12:00:00 AM	Site id:	AZ7000000028575

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**P121**  
**NNW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS AZ7000000028576**

Program:	55	Registry i:	568107
Owner name:	US EPA REGION 9		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	611		
Approved:	4/17/1998 12:00:00 AM	Installed:	5/14/1998 12:00:00 AM
Well depth:	140		
Water leve:	76		
Casing dep:	75		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014007DCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504630.5		
Utm y mete:	3555602		
Applicatio:	4/10/1998 12:00:00 AM	Site id:	AZ7000000028576

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**P122**  
**NNW**  
**1/4 - 1/2 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028577**

Program:	55	Registry i:	568108
Owner name:	US EPA REGION 9		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	611		
Approved:	4/17/1998 12:00:00 AM	Installed:	5/7/1998 12:00:00 AM
Well depth:	180		
Water leve:	76		
Casing dep:	75		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014007DCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504630.5		
Utm y mete:	3555602		
Applicatio:	4/10/1998 12:00:00 AM	Site id:	AZ7000000028577

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

124  
NNW  
1/4 - 1/2 Mile  
Lower

AZ WELLS AZ7000000028578

Program:	55	Registry i:	569536
Owner name:	US EPA REGION 9		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	611		
Approved:	7/14/1998 12:00:00 AM	Installed:	8/4/1998 12:00:00 AM
Well depth:	140		
Water leve:	79		
Casing dep:	75		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014007CDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504429.4		
Utm y mete:	3555602		
Applicatio:	7/1/1998 12:00:00 AM	Site id:	AZ7000000028578

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

136  
NW  
1/4 - 1/2 Mile  
Lower

AZ WELLS AZ7000000028579

Program:	55	Registry i:	212201
Owner name:	U. S. E.P.A.		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	78		
Approved:	5/8/2006 12:00:00 AM	Installed:	5/23/2006 12:00:00 AM
Well depth:	102		
Water leve:	84		
Casing dep:	100		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014007CDB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504228.2		
Utm y mete:	3555602		
Applicatio:	5/4/2006 12:00:00 AM	Site id:	AZ7000000028579

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

145  
NE  
1/2 - 1 Mile  
Higher

AZ WELLS

AZ7000000028580

Program:	55	Registry i:	801436
Owner name:	SUNNYSIDE UNIFIED,	Welltype:	NON-EXEMPT
Rgr pump d:	YES		
Well type :	NON-EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	60		
Testedrate:	60		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014008CCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	8		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	505437.1		
Utm y mete:	3555603		
Applicatio:	4/16/1984 12:00:00 AM	Site id:	AZ7000000028580



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**390**  
**ENE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS AZ7000000028581**

Program:	55	Registry i:	808386
Owner name:	SAEED MAHMOODI		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	1/1/1953 12:00:00 AM
Well depth:	178		
Water leve:	124		
Casing dep:	178		
Casing dia:	6		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR 1 - 5 HP		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014008DCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	8		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	506253.7		
Utm y mete:	3555606		
Applicatio:	9/3/2002 12:00:00 AM	Site id:	AZ7000000028581

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

511  
WNW  
1 - 2 Miles  
Lower

AZ WELLS

AZ7000000028613

Program:	55	Registry i:	507253
Owner name:	TUCSON WATER		
Rgr pump d:	NO	Welltype:	EXPLORATION
Well type :	OTHER		
Dlic num:	342		
Approved:	Not Reported	Installed:	6/30/1984 12:00:00 AM
Well depth:	162		
Water leve:	93		
Casing dep:	150		
Casing dia:	16		
Casing typ:	PLASTIC OR PVC		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR 1 - 5 HP		
Pumprate:	60		
Testedrate:	60		
Draw down:	10		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013012DBC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503020.7		
Utm y mete:	3555799		
Applicatio:	2/17/1984 12:00:00 AM	Site id:	AZ7000000028613

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

295  
NW  
1/2 - 1 Mile  
Lower

AZ WELLS

AZ7000000028614

Program:	55	Registry i:	504631
Owner name:	EPA REGION 9,		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	25		
Approved:	Not Reported	Installed:	1/28/1983 12:00:00 AM
Well depth:	250		
Water leve:	91		
Casing dep:	250		
Casing dia:	10		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR < 1 HP		
Pumprate:	14		
Testedrate:	14		
Draw down:	7		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15013012DAD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	503624.5		
Utm y mete:	3555803		
Applicatio:	1/13/1983 12:00:00 AM	Site id:	AZ7000000028614

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

135  
North  
1/4 - 1/2 Mile  
Higher

AZ WELLS AZ7000000028615

Program:	55	Registry i:	805265
Owner name:	RAWHIDE HOLDINGS C/O DOUGLASS MARSHALL		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	161		
Approved:	4/18/2000 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	8		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	A	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014007DBD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504831.4		
Utm y mete:	3555804		
Applicatio:	4/10/2000 12:00:00 AM	Site id:	AZ7000000028615

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**U149**  
**NW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028616**

Program:	55	Registry i:	212192
Owner name:	U. S. E.P.A.		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	78		
Approved:	5/8/2006 12:00:00 AM	Installed:	5/30/2006 12:00:00 AM
Well depth:	102		
Water leve:	79		
Casing dep:	100		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014007CAC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	504228.2		
Utm y mete:	3555804		
Applicatio:	5/4/2006 12:00:00 AM	Site id:	AZ7000000028616

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**U150**  
**NW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028617**

Program:	55	Registry i:	212202
Owner name:	U. S. E.P.A.		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	78		
Approved:	5/8/2006 12:00:00 AM	Installed:	5/30/2006 12:00:00 AM
Well depth:	102		
Water leve:	79		
Casing dep:	100		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014007CAC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	504228.2		
Utm y mete:	3555804		
Applicatio:	5/4/2006 12:00:00 AM	Site id:	AZ7000000028617

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**U151**  
**NW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028618**

Program:	55	Registry i:	569535
Owner name:	US EPA REGION 9		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	611		
Approved:	7/14/1998 12:00:00 AM	Installed:	7/30/1998 12:00:00 AM
Well depth:	140		
Water leve:	79		
Casing dep:	77		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014007CAC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	504228.2		
Utm y mete:	3555804		
Applicatio:	7/1/1998 12:00:00 AM	Site id:	AZ7000000028618

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AH246**  
**NW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028619**

Program:	55	Registry i:	620003
Owner name:	TUCSON, CITY OF,		
Rgr pump d:	NO	Welltype:	NON-EXEMPT
Well type :	NON-EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	7/1/1953 12:00:00 AM
Well depth:	370		
Water leve:	100		
Casing dep:	370		
Casing dia:	12		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014007CBC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	C	Qacre160di:	SW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.7		
Utm y mete:	3555804		
Applicatio:	6/9/1982 12:00:00 AM	Site id:	AZ7000000028619



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BX491**  
**WNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028654**

Program:	55	Registry i:	620000
Owner name:	TUCSON, CITY OF,		
Rgr pump d:	NO	Welltype:	NON-EXEMPT
Well type :	NON-EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	7/1/1960 12:00:00 AM
Well depth:	189		
Water leve:	0		
Casing dep:	189		
Casing dia:	10		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013012DBA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503222.2		
Utm y mete:	3556004		
Applicatio:	6/9/1982 12:00:00 AM	Site id:	AZ7000000028654

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BX492**  
**WNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028655**

Program:	55	Registry i:	620001
Owner name:	TUCSON, CITY OF,		
Rgr pump d:	NO	Welltype:	NON-EXEMPT
Well type :	NON-EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	3/1/1969 12:00:00 AM
Well depth:	900		
Water leve:	103		
Casing dep:	900		
Casing dia:	16		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	279		
Testedrate:	279		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013012DBA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503222.2		
Utm y mete:	3556004		
Applicatio:	6/9/1982 12:00:00 AM	Site id:	AZ7000000028655

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

159

North  
1/2 - 1 Mile  
Higher

AZ WELLS

AZ7000000028656

Program:	55	Registry i:	539238
Owner name:	SOUTHWEST GAS CORP,	Welltype:	EXPLORATION
Rgr pump d:	NO		
Well type :	OTHER		
Dlic num:	392		
Approved:	Not Reported	Installed:	12/18/1993 12:00:00 AM
Well depth:	80		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	N	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014007DBB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	D	Qacre160di:	SE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504630.1		
Utm y mete:	3556007		
Applicatio:	5/18/1993 12:00:00 AM	Site id:	AZ7000000028656

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AF200**  
**NNW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028682**

Program:	55	Registry i:	637976
Owner name:	LUPTON,J M		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	1/1/1947 12:00:00 AM
Well depth:	135		
Water leve:	95		
Casing dep:	10		
Casing dia:	6		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	25		
Testedrate:	25		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014007000
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	0	Qacre160di:	Not Reported
Quarter 40:	0	Qacre40dir:	Not Reported
Quarter 10:	0	Qacre10dir:	Not Reported
Utm x mete:	504529.1		
Utm y mete:	3556107		
Applicatio:	6/14/1982 12:00:00 AM	Site id:	AZ7000000028682

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AF201**  
**NNW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028683**

Program:	55	Registry i:	640055
Owner name:	WOFFORD,R		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	1/1/1954 12:00:00 AM
Well depth:	317		
Water leve:	110		
Casing dep:	317		
Casing dia:	8		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	25		
Testedrate:	25		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014007000
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	0	Qacre160di:	Not Reported
Quarter 40:	0	Qacre40dir:	Not Reported
Quarter 10:	0	Qacre10dir:	Not Reported
Utm x mete:	504529.1		
Utm y mete:	3556107		
Applicatio:	6/28/1982 12:00:00 AM	Site id:	AZ7000000028683

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AF202**  
**NNW**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS** **AZ7000000028684**

Program:	55	Registry i:	638495
Owner name:	GLAZIER,W L		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014007000
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	0	Qacre160di:	Not Reported
Quarter 40:	0	Qacre40dir:	Not Reported
Quarter 10:	0	Qacre10dir:	Not Reported
Utm x mete:	504529.1		
Utm y mete:	3556107		
Applicatio:	6/14/1982 12:00:00 AM	Site id:	AZ7000000028684

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

519  
NW  
1 - 2 Miles  
Lower

AZ WELLS

AZ7000000028708

Program:	55	Registry i:	640042
Owner name:	EMERY PARK MOBILE,	Welltype:	EXEMPT
Rgr pump d:	YES		
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013012ACD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	503222.3		
Utm y mete:	3556207		
Applicatio:	6/21/1982 12:00:00 AM	Site id:	AZ7000000028708

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AL238**  
**NNE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028709**

Program:	55	Registry i:	640351
Owner name:	GENE D LUCAS		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	30		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014007ADC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505031.9		
Utm y mete:	3556209		
Applicatio:	7/9/1982 12:00:00 AM	Site id:	AZ7000000028709



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AL239**  
**NNE**  
**1/2 - 1 Mile**  
**Higher**

**AZ WELLS**

**AZ7000000028710**

Program:	55	Registry i:	801437
Owner name:	SUNNYSIDE UNIFIED,		
Rgr pump d:	YES	Welltype:	NON-EXEMPT
Well type :	NON-EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	4/18/1956 12:00:00 AM
Well depth:	240		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	110		
Testedrate:	110		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014007ADC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	505031.9		
Utm y mete:	3556209		
Applicatio:	4/16/1984 12:00:00 AM	Site id:	AZ7000000028710

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**AU310**  
**NNW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS** **AZ7000000028711**

Program:	55	Registry i:	569534
Owner name:	US EPA REGION 9		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	611		
Approved:	7/14/1998 12:00:00 AM	Installed:	7/29/1998 12:00:00 AM
Well depth:	120		
Water leve:	75		
Casing dep:	82		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014007BCD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504027.1		
Utm y mete:	3556209		
Applicatio:	7/1/1998 12:00:00 AM	Site id:	AZ7000000028711

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AU311**  
**NNW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028712**

Program:	55	Registry i:	571863
Owner name:	US EPA REGION 9		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	611		
Approved:	12/3/1998 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014007BCD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504027.1		
Utm y mete:	3556209		
Applicatio:	10/27/1998 12:00:00 AM	Site id:	AZ7000000028712

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

345  
NW  
1/2 - 1 Mile  
Lower

AZ WELLS AZ7000000028713

Program:	55	Registry i:	571121
Owner name:	US EPA REGION 9		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	611		
Approved:	11/16/1998 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014007BCC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.7		
Utm y mete:	3556209		
Applicatio:	10/1/1998 12:00:00 AM	Site id:	AZ7000000028713

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

296

North  
1/2 - 1 Mile  
Lower

AZ WELLS

AZ7000000028755

Program:	55	Registry i:	510259
Owner name:	SMITH,P		
Rgr pump d:	NO	Welltype:	DOMESTIC STOCK EXEMPT
Well type :	EXEMPT		
Dlic num:	8		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014007ACA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504830.7		
Utm y mete:	3556412		
Applicatio:	2/6/1985 12:00:00 AM	Site id:	AZ7000000028755

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AX325**  
**NNW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028756**

Program:	55	Registry i:	629548
Owner name:	LUCAS,F D		
Rgr pump d:	NO	Welltype:	NON-EXEMPT
Well type :	NON-EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	45		
Testedrate:	45		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014007BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504428.8		
Utm y mete:	3556412		
Applicatio:	7/9/1982 12:00:00 AM	Site id:	AZ7000000028756

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AX326**  
**NNW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028757**

Program:	55	Registry i:	634079
Owner name:	ALVIN AND JERRY NELSON		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	149		
Approved:	Not Reported	Installed:	1/1/1949 12:00:00 AM
Well depth:	160		
Water leve:	85		
Casing dep:	160		
Casing dia:	6		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	35		
Testedrate:	35		
Draw down:	0		
Completion:	A	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014007BDA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504428.8		
Utm y mete:	3556412		
Applicatio:	6/14/1982 12:00:00 AM	Site id:	AZ7000000028757

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

343  
NNW  
1/2 - 1 Mile  
Lower

AZ WELLS AZ7000000028758

Program:	55	Registry i:	581935
Owner name:	ENVIRONMENTAL PROTECTION AGENCY REGION IX SUPERFUND DIV		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	611		
Approved:	7/7/2000 12:00:00 AM	Installed:	8/28/2000 12:00:00 AM
Well depth:	140		
Water leve:	90		
Casing dep:	140		
Casing dia:	4		
Casing typ:	PLASTIC OR PVC		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014007BDB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	504227.9		
Utm y mete:	3556412		
Applicatio:	6/23/2000 12:00:00 AM	Site id:	AZ7000000028758



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**385**  
**NNW**  
**1/2 - 1 Mile**  
**Lower**

**AZ WELLS**

**AZ7000000028759**

Program:	55	Registry i:	639456
Owner name:	FERNLUND,D W		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	113		
Water leve:	100		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	35		
Testedrate:	35		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014007BCA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	504027		
Utm y mete:	3556412		
Applicatio:	6/9/1982 12:00:00 AM	Site id:	AZ7000000028759

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BK401**  
**NW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028760**

Program:	55	Registry i:	557816
Owner name:	TUCSON, CITY OF,		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	388		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	280		
Water leve:	0		
Casing dep:	0		
Casing dia:	8		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	A	Drill log:	N
Well cance:	Y	Cadastral:	D15014007BCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.7		
Utm y mete:	3556412		
Applicatio:	5/10/1996 12:00:00 AM	Site id:	AZ7000000028760

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BK402**  
**NW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028761**

Program:	55	Registry i:	571122
Owner name:	U.S. EPA REGION 9		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	611		
Approved:	11/16/1998 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014007BCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.7		
Utm y mete:	3556412		
Applicatio:	10/1/1998 12:00:00 AM	Site id:	AZ7000000028761

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BK403**  
**NW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028762**

Program:	55	Registry i:	571123
Owner name:	U.S. EPA REGION 9		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	611		
Approved:	11/16/1998 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014007BCB
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	C	Qacre40dir:	SW
Quarter 10:	B	Qacre10dir:	NW
Utm x mete:	503825.7		
Utm y mete:	3556412		
Applicatio:	10/1/1998 12:00:00 AM	Site id:	AZ7000000028762

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BW488**  
**NW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS** **AZ7000000028763**

Program:	55	Registry i:	628756
Owner name:	CAMILLO & ESTHER MACIAS		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	100		
Water leve:	100		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013012ADA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503624.8		
Utm y mete:	3556412		
Applicatio:	12/24/1981 12:00:00 AM	Site id:	AZ7000000028763

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BW489**  
**NW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS AZ7000000028764**

Program:	55	Registry i:	636501
Owner name:	RUBEN & ROSAMARIA ANDRADE		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	1/1/1925 12:00:00 AM
Well depth:	213		
Water leve:	94		
Casing dep:	213		
Casing dia:	6		
Casing typ:	OTHER - BLACK STEEL - IRON - SEAMLESS		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	20		
Testedrate:	20		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15013012ADA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	13		
Half range:	0		
Eastwest:	E		
Section:	12		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	D	Qacre40dir:	SE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	503624.8		
Utm y mete:	3556412		
Applicatio:	6/14/1982 12:00:00 AM	Site id:	AZ7000000028764

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BH393**  
**NNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028776**

Program:	55	Registry i:	638813
Owner name:	FORD,J C		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	1/1/1930 12:00:00 AM
Well depth:	260		
Water leve:	90		
Casing dep:	250		
Casing dia:	0		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	35		
Testedrate:	35		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014007B00
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	0	Qacre40dir:	Not Reported
Quarter 10:	0	Qacre10dir:	Not Reported
Utm x mete:	504127.1		
Utm y mete:	3556513		
Applicatio:	6/14/1982 12:00:00 AM	Site id:	AZ7000000028776

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BH394**  
**NNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS** **AZ7000000028777**

Program:	55	Registry i:	640348
Owner name:	MOORE,C F		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	6/15/1950 12:00:00 AM
Well depth:	130		
Water leve:	90		
Casing dep:	0		
Casing dia:	6		
Casing typ:	STEEL - PERFORATED OR SLOTTED CASING		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	6		
Testedrate:	6		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014007B00
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	0	Qacre40dir:	Not Reported
Quarter 10:	0	Qacre10dir:	Not Reported
Utm x mete:	504127.1		
Utm y mete:	3556513		
Applicatio:	7/9/1982 12:00:00 AM	Site id:	AZ7000000028777



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

392  
North  
1/2 - 1 Mile  
Lower

AZ WELLS AZ7000000028817

Program:	55	Registry i:	573460
Owner name:	SHERMAN PAUL TOMLINSON		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	623		
Approved:	3/23/1999 12:00:00 AM	Installed:	10/13/1999 12:00:00 AM
Well depth:	265		
Water leve:	225		
Casing dep:	265		
Casing dia:	5		
Casing typ:	PLASTIC OR PVC		
Pump type:	SUBMERSIBLE		
Pump power:	ELECTRIC MOTOR 1 - 5 HP		
Pumprate:	32		
Testedrate:	90		
Draw down:	20		
Completion:	X	Drill log:	X
Well cance:	Not Reported	Cadastral:	D15014007ABC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	504629.6		
Utm y mete:	3556614		
Applicatio:	3/23/1999 12:00:00 AM	Site id:	AZ7000000028817

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

395  
NNW  
1 - 2 Miles  
Lower

AZ WELLS AZ7000000028818

Program:	55	Registry i:	639537
Owner name:	MARTIN TESTER		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	110		
Water leve:	0		
Casing dep:	10		
Casing dia:	10		
Casing typ:	OTHER - BLACK STEEL - IRON - SEAMLESS		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014007BAD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504428.7		
Utm y mete:	3556614		
Applicatio:	6/14/1982 12:00:00 AM	Site id:	AZ7000000028818

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

411  
NNW  
1 - 2 Miles  
Lower

AZ WELLS

AZ7000000028819

Program:	55	Registry i:	400162
Owner name:	U OF A FOUNDATION		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	580		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014007BAC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	504227.8		
Utm y mete:	3556614		
Applicatio:	1/14/2000 12:00:00 AM	Site id:	AZ7000000028819

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BS468**  
**NNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028820**

Program:	55	Registry i:	400124
Owner name:	PENELOPE A LOWE		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	616		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	A	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014007BBD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504027		
Utm y mete:	3556614		
Applicatio:	9/27/1999 12:00:00 AM	Site id:	AZ7000000028820

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BS469**  
**NNW**  
**1 - 2 Miles**  
**Lower**

**AZ WELLS**

**AZ7000000028821**

Program:	55	Registry i:	638992
Owner name:	GRENIER,J J		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014007BBD
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	D	Qacre10dir:	SE
Utm x mete:	504027		
Utm y mete:	3556614		
Applicatio:	6/14/1982 12:00:00 AM	Site id:	AZ7000000028821

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

500  
NNW  
1 - 2 Miles  
Lower

AZ WELLS AZ7000000028822

Program:	55	Registry i:	571124
Owner name:	U.S. EPA REGION 9		
Rgr pump d:	NO	Welltype:	MONITOR
Well type :	MONITOR		
Dlic num:	611		
Approved:	11/16/1998 12:00:00 AM	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	Not Reported		
Pump type:	Not Reported		
Pump power:	Not Reported		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Y	Cadastral:	D15014007BBC
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	B	Qacre160di:	NW
Quarter 40:	B	Qacre40dir:	NW
Quarter 10:	C	Qacre10dir:	SW
Utm x mete:	503825.7		
Utm y mete:	3556614		
Applicatio:	10/1/1998 12:00:00 AM	Site id:	AZ7000000028822

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

501  
NNE  
1 - 2 Miles  
Higher

AZ WELLS AZ7000000028867

Program:	55	Registry i:	640350
Owner name:	DIAZ, RAUL,		
Rgr pump d:	NO	Welltype:	EXEMPT
Well type :	EXEMPT		
Dlic num:	0		
Approved:	Not Reported	Installed:	Not Reported
Well depth:	0		
Water leve:	0		
Casing dep:	0		
Casing dia:	0		
Casing typ:	NO CASING CODE LISTED		
Pump type:	NO PUMP CODE LISTED		
Pump power:	NO POWER CODE LISTED		
Pumprate:	0		
Testedrate:	0		
Draw down:	0		
Completion:	Not Reported	Drill log:	Not Reported
Well cance:	Not Reported	Cadastral:	D15014007AAA
County:	PIMA	Watershed:	SANTA CRUZ RIVER
Basin name:	TUCSON AMA	Subbasin n:	UPPER SANTA CRUZ
Ama:	TUCSON	Quad code:	D
Whole town:	15		
Half towns:	0		
Northsouth:	S		
Whole rang:	14		
Half range:	0		
Eastwest:	E		
Section:	7		
Quarter 16:	A	Qacre160di:	NE
Quarter 40:	A	Qacre40dir:	NE
Quarter 10:	A	Qacre10dir:	NE
Utm x mete:	505231.7		
Utm y mete:	3556816		
Applicatio:	7/15/1982 12:00:00 AM	Site id:	AZ7000000028867

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AR292**  
**West**  
**1/2 - 1 Mile**  
**Lower**

**FED USGS**

**USGS40000030721**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	AZ014-320750110574601		
Monloc name:	D-15-13 13AAC1		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1306639
Longitude:	-110.9637167	Sourcemap scale:	24000
Horiz Acc measure:	.01	Horiz Acc measure units:	seconds
Horiz Collection method:	Differentially corrected Global Positioning System (DGPS)		
Horiz coord refsys:	NAD83	Vert measure val:	2533.9
Vert measure units:	feet	Vertacc measure val:	0.5
Vert accmeasure units:	feet		
Vertcollection method:	Differential Global Positioning System (GPS)r		
Vert coord refsys:	NAVD88	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	19830122	Welldepth:	393
Welldepth units:	ft	Wellholedepth:	393
Wellholedepth units:	ft		
Ground-water levels, Number of Measurements: 0			



## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**S137**  
**WNW**  
**1/2 - 1 Mile**  
**Lower**

**FED USGS USGS40000030724**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	AZ014-320803110572401		
Monloc name:	D-15-14 07CCD2		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1344167
Longitude:	-110.9573083	Sourcemap scale:	24000
Horiz Acc measure:	.01	Horiz Acc measure units:	seconds
Horiz Collection method:	Differentially corrected Global Positioning System (DGPS)		
Horiz coord refsys:	NAD83	Vert measure val:	2538.0
Vert measure units:	feet	Vertacc measure val:	0.5
Vert accmeasure units:	feet		
Vertcollection method:	Differential Global Positioning System (GPS)r		
Vert coord refsys:	NAVD88	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	19831119	Welldepth:	233
Welldepth units:	ft	Wellholedepth:	235
Wellholedepth units:	ft		
Ground-water levels, Number of Measurements: 0			

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BD344**  
**SW**  
**1/2 - 1 Mile**  
**Lower**

**FED USGS USGS40000036414**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320723110574101		
Monloc name:	D-15-13 13DDA1		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1231338
Longitude:	-110.9620357	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2546.
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		
Ground-water levels, Number of Measurements: 1			
	Feet below	Feet to	
Date	Surface	Sealevel	
-----			
1981-12-22	59.7		

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AS294**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**FED USGS**

**USGS40000036421**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320726110573701		
Monloc name:	D-15-14 18CBB		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1239671
Longitude:	-110.9609246	Sourcemap scale:	24000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2550.
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	320
Welldepth units:	ft	Wellholedepth:	320
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 7

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1992-02-28	116.00		1991-01-11	113.30	
1989-01-04	113.40		1987-12-21	109.00	
1986-12-26	102.20		1986-01-09	104.20	
1985-01-04	105.10				

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**Z185**  
**SE**  
**1/2 - 1 Mile**  
**Higher**

**FED USGS**

**USGS40000036425**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320727110562901		
Monloc name:	D-15-14 17CBC		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1242449
Longitude:	-110.942035	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2580.
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 16

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1981-12-23	102.6		1972-03-13	101.70	
1971-03-12	101.51		1970-02-17	97.05	
1969-02-27	104.50		1968-03-27	94.48	
1967-03-15	93.50		1965-03-02	91.31	
1964-03-18	87.98		1963-03-29	87.74	
1962-02-07	87.66		1961-02-08	87.04	
1960-02-12	84.94		1959-02-06	84.00	
1958-02-04	84.90		1956-02-17	77.11	

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AA183**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**FED USGS**

**USGS40000036429**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320728110572301		
Monloc name:	D-15-14 18CBD		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1245226
Longitude:	-110.9570355	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2561.
Vert measure units:	feet	Vertacc measure val:	1
Vert accmeasure units:	feet		
Vertcollection method:	Level or other surveying method		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	19411200	Welldepth:	250
Welldepth units:	ft	Wellholedepth:	250
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 26

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1981-12-23	96.08		1972-03-13	92.90	
1971-03-12	87.55		1970-02-17	89.70	
1969-02-27	86.50		1968-03-27	85.90	
1967-03-14	83.85		1965-03	84.11	
1964-03-18	81.65		1963-03-29	80.20	
1962-02-07	77.50		1961-02-08	76.87	
1960-02-12	75.46		1959-02-06	75.33	
1958-02-04	75.39		1957-02-18	69.59	
1956-02-21	74.35		1955-02-17	73.71	
1954-02-15	74.20		1953-02-16	77.14	
1952-02-13	74.60		1951-02-26	73.18	
1950-02-14	70.91		1949-02-15	70.64	
1948-02-26	70.17		1947-03-06	70.71	

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AI213**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**FED USGS**

**USGS40000036430**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320728110572801		
Monloc name:	D-15-14 18CBC1		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1245226
Longitude:	-110.9584245	Sourcemap scale:	62500
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsyzs:	NAD83	Vert measure val:	2550.
Vert measure units:	feet	Vertacc measure val:	12
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsyzs:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	19420900	Welldepth:	320
Welldepth units:	ft	Wellholedepth:	320
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 17

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1962	71.65		1961	75.65	
1960	71.88		1959	72.83	
1958	73.78		1957	72.62	
1956	74.51		1955	74.52	
1954	74.71		1952	73.28	
1951	72.08		1950	71.78	
1949	71.16		1948	70.58	
1947	69.82		1946-01-01	69.62	
1946	69.62				

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**X160**  
**SW**  
**1/2 - 1 Mile**  
**Higher**

**FED USGS**

**USGS40000036436**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320731110572401		
Monloc name:	D-15-14 18CBA		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1253559
Longitude:	-110.9573133	Sourcemap scale:	24000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2561.
Vert measure units:	feet	Vertacc measure val:	1
Vert accmeasure units:	feet		
Vertcollection method:	Level or other surveying method		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	19411000	Welldepth:	244
Welldepth units:	ft	Wellholedepth:	244
Wellholedepth units:	ft		
Ground-water levels, Number of Measurements: 0			

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AW347**

**East  
1/2 - 1 Mile  
Higher**

**FED USGS**

**USGS40000036484**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320751110555701		
Monloc name:	D-15-14 17ABC1		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1309114
Longitude:	-110.9331458	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2591.
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
-----		

1981-12-21 123.8



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AW324**

**East  
1/2 - 1 Mile  
Higher**

**FED USGS**

**USGS40000036490**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320753110560101		
Monloc name:	D-15-14 17ABC2		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.131467
Longitude:	-110.9342569	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2592.
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 2

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1984-01-05	127.60		1981-12-21	131.1	

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**T146**  
**East**  
**1/2 - 1 Mile**  
**Higher**

**FED USGS**

**USGS40000036500**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320758110562201		
Monloc name:	D-15-14 17BBA		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1328558
Longitude:	-110.9400905	Sourcemap scale:	62500
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2574.
Vert measure units:	feet	Vertacc measure val:	12
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 5

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1967-03-10	117.73		1965-01-18	111.62	
1960-02	81.41		1959-01-01	80.93	
1959	80.93				

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**D18**  
**NW**  
**1/8 - 1/4 Mile**  
**Lower**

**FED USGS USGS40000036501**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320758110570101		
Monloc name:	D-15-14 18ABB		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1328558
Longitude:	-110.9509242	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2542.
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	19570717	Welldepth:	402
Welldepth units:	ft	Wellholedepth:	402
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 2

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1987-12-01	104.40		1981-12-22	93.4	

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

V161  
West  
1/2 - 1 Mile  
Lower

FED USGS

USGS40000036503

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320759110573401		
Monloc name:	D-15-14 18BBB		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1331336
Longitude:	-110.9600912	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2541.
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	196404	Welldepth:	1000
Welldepth units:	ft	Wellholedepth:	1000
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 27

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1992-01-21	222.19		1991-01-09	219.52	
1987-12-28	206.40		1986-12-23	200.30	
1986-01-10	199.80		1985-01-04	207.10	
1984-01-06	219.10		1982-12-01	233.60	
1982-01-04	229.5		1971-08-01	185.00	
1970-04-27	179.95		1968-11-05	175.20	
1968-06-17	169.60		1968-05-16	166.80	
1968-03-02	162.00		1968-01-18	161.40	
1967-02-20	159.20		1966-04-19	159.70	
1966-01-15	159.70		1965-12-15	163.70	
1965-10-15	167.20		1965-09-27	165.20	
1965-08-12	168.20		1965-07-08	153.90	
1965-03-03	152.70		1964-05-01	101.33	
1964-04-21	82.81				

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AP285**  
**West**  
**1/2 - 1 Mile**  
**Lower**

**FED USGS**

**USGS40000036509**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320801110574501		
Monloc name:	D-15-13 13AAB		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1336891
Longitude:	-110.9631469	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2530.
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	210
Welldepth units:	ft	Wellholedepth:	210
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 14

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1989-04-25	105.60				
1988-10-18	115.20				
Note: The site was being pumped.					
1988-05-24	117.40				
Note: The site was being pumped.					
1988-02-29	103.00		1987-12-01	101.00	
1987-11-18	102.50		1987-05-25	99.80	
1986-11-19	99.20		1986-08-25	101.30	
1986-02-25	112.10				
Note: The site was being pumped.					
1985-10-07	100.30		1985-07-08	101.60	
1984-01-05	102.30		1981-12-21	104.8	

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BB384**  
**East**  
**1/2 - 1 Mile**  
**Higher**

**FED USGS USGS40000036512**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320802110555601		
Monloc name:	D-15-14 17ABB		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1339669
Longitude:	-110.932868	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2590.
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	450
Wellholedepth units:	ft		
Ground-water levels, Number of Measurements: 0			

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BE346**  
**WNW**  
**1/2 - 1 Mile**  
**Lower**

**FED USGS USGS40000036548**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320813110574901		
Monloc name:	D-15-13 12DDB1		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1370223
Longitude:	-110.964258	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2523.
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		
Ground-water levels, Number of Measurements: 0			

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**BE362**  
**WNW**  
**1/2 - 1 Mile**  
**Lower**

**FED USGS USGS40000036550**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320815110574901		
Monloc name:	D-15-13 12DDB2		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1375779
Longitude:	-110.964258	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2522.
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		
Ground-water levels, Number of Measurements: 1			
	Feet below	Feet to	
Date	Surface	Sealevel	
-----			
1981-12-22	101.0		



## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**BE383**  
**WNW**  
**1/2 - 1 Mile**  
**Lower**

**FED USGS**

**USGS40000036554**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320817110574901		
Monloc name:	D-15-13 12DAC3		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1381334
Longitude:	-110.964258	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2522.
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		
Ground-water levels, Number of Measurements: 0			

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

AH211  
NW  
1/2 - 1 Mile  
Lower

FED USGS

USGS40000036556

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320818110572801		
Monloc name:	D-15-14 07CBC		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1384112
Longitude:	-110.9584245	Sourcemap scale:	24000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2531.
Vert measure units:	feet	Vertacc measure val:	5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	195307	Welldepth:	370
Welldepth units:	ft	Wellholedepth:	370
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 48

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1992-02-28	104.95		1991-01-09	104.37	
1989-01-04	101.50		1987-12-21	99.10	
1986-12-29	95.10		1986-01-09	94.40	
1985-01-04	95.60		1984-01-06	97.00	
1982-12-01	99.40		1981-12-22	100.20	
1971-03-03	95.05		1970-02-19	88.06	
1969-02-24	90.48		1968-03-22	84.28	
1967-10	87.0		1967-09	89.8	
1967-08	89.8		1967-07	87.9	
1967-05-16	84.0		1967-04-13	82.2	
1967-03	82.8		1967-02-10	81.1	
1967-01-15	101.1		1966-12-28	101.2	
1966-11-18	100.7		1966-10-15	101.2	
1966-09-15	101.9		1966-08-22	101.4	
1966-07-15	101.0		1966-06-15	100.0	
1966-05-11	78.0		1966-04-19	82.7	
1966-03-04	82.9		1966-01-15	83.0	
1965-12-15	90.1		1965-10-15	87.1	
1965-09-29	84.2		1965-06-28	101.3	
1965-03-03	82.22		1964-03-06	83.90	
1963-03-07	85.60		1961-04-07	85.31	
1960-04-14	78.90		1959-03-20	72.08	
1958-03-10	67.66		1957-06-14	73.28	
1956-03-29	66.24		1954-03-08	67.68	

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database EDR ID Number

**391**  
**WNW**  
**1/2 - 1 Mile**  
**Lower**

**FED USGS USGS40000036557**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320818110574901		
Monloc name:	D-15-13 12DAC2		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1384112
Longitude:	-110.964258	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2520.
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		
Ground-water levels, Number of Measurements: 0			

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**195**  
**NE**  
**1/2 - 1 Mile**  
**Higher**

**FED USGS**

**USGS40000036559**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320820110562801		
Monloc name:	D-15-14 08CBC		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1389668
Longitude:	-110.9417572	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2567.
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		
Ground-water levels, Number of Measurements: 0			

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AE196**  
**NW**  
**1/2 - 1 Mile**  
**Lower**

**FED USGS**

**USGS40000036568**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320823110571901		
Monloc name:	D-15-14 07CAB2		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1398001
Longitude:	-110.9559244	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2536.
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	19561200	Welldepth:	225
Welldepth units:	ft	Wellholedepth:	225
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 8

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1988-10-17	197.90				
Note: The site was being pumped.					
1988-05-23	174.20				
Note: The site was being pumped.					
1987-12-01	90.00		1987-11-19	100.40	
1987-05-27	105.70		1986-11-19	106.10	
1985-10-14	108.30		1981-12-21	96.9	

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AE203**  
**NNW**  
**1/2 - 1 Mile**  
**Lower**

**FED USGS**

**USGS40000036575**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320825110571701		
Monloc name:	D-15-14 07CAB3		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1403556
Longitude:	-110.9553688	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2538.
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported		
Welldepth units:	ft	Welldepth:	225
Wellholedepth units:	ft	Wellholedepth:	225
Ground-water levels, Number of Measurements: 0			

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**249**  
**NE**  
**1/2 - 1 Mile**  
**Higher**

**FED USGS**

**USGS40000036576**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320826110562701		
Monloc name:	D-15-14 08CBB		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1406334
Longitude:	-110.9414794	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2565.
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		
Ground-water levels, Number of Measurements: 0			

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AE237**  
**NNW**  
**1/2 - 1 Mile**  
**Lower**

**FED USGS**

**USGS40000036580**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320827110571801		
Monloc name:	D-15-14 07CAB1		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1409112
Longitude:	-110.9556466	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2535.
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	194612	Welldepth:	120
Welldepth units:	ft	Wellholedepth:	120
Wellholedepth units:	ft		
Ground-water levels, Number of Measurements: 0			



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance  
Elevation

Database

EDR ID Number

**AL248**  
**NNE**  
**1/2 - 1 Mile**  
**Higher**

**FED USGS**

**USGS40000036588**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-320830110563901		
Monloc name:	D-15-14 07ADC		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15050301	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	32.1423001
Longitude:	-110.9456463	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	2562.
Vert measure units:	feet	Vertacc measure val:	12
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	440
Welldepth units:	ft	Wellholedepth:	440
Wellholedepth units:	ft		
Ground-water levels, Number of Measurements: 1			
	Feet below	Feet to	
Date	Surface	Sealevel	
-----			
1968-09-28	138.11		

## **APPENDIX C-3**

### **STORMWATER OUTFALLS AND DRAINAGE AREA INFORMATION**

**Table 2.1 Outfall Descriptions**

<b>Outfall ID</b>	<b>Industrial Activities Associated With Outfall</b>	<b>SIC Class</b>
<b>W01</b>	Drains from the southern apron of the Airport through the back parking lot to the open ditch on the west end of property (some offsite drainage included).	P & S
<b>W02</b>	From a single catch basin picking up only roadway and parking lot runoff	None
<b>W03</b>	POL drainage area (when OWS is closed) (same drainage area as W04)	P
<b>W04</b>	POL drainage area (Secondary containment is drained when manual locks have been opened)	P
<b>W05</b>	One catch basin that collects water ponding at fenceline in POL yard. Runoff is all collected from curbed roadway.	None
<b>W06</b>	Collects water from the Paint Booth, Haz CAP, Fuel Systems Shop, Engine I and R; picking up runoff from the Fire House and AGE , CE and TAGRA	P
<b>W07</b>	One catch basin that collects water running between Buildings 5 & 6. No industrial activities or storage of Haz Mat.	None
<b>W08</b>	One catch basin that collects water running behind Building 5. . No industrial activities or storage of Haz Mat	None
<b>W09</b>	One catch basin that collects water running behind Building 5 and Guard shack.	None
<b>W10</b>	Collects water from the Hush Houses and Hangars 10 & 12, picking up runoff from landscape areas next to Air Guard Way	P
<b>W11</b>	Two culverts that collect water from Air Park and from paved area around Building 41 & 44.	P
<b>W12</b>	Landscape runoff from Building 4 and parking area for that building.	None
<b>W13</b>	Collection of catch basins from Buildings 44 and 49 and paved parking area to Building 49.	P
<b>W14</b>	Runoff from Shark Pit and area behind Building 49. No industrial work in this area. Majority of runoff from Flightline apron.	P

**Table 2.2 Base Storm Water Discharge Outfalls**

OUTFALL I.D.	OUTFALL TYPE	LATITUDE*	LONGITUDE*
W01	48-inch CMP	N 32° 13' 35"	W -110° 95' 36"
W02	24-inch RCP	N 32° 13' 35"	W -110° 95' 25"
W03	24-inch CMP	N 32° 13' 35"	W -110° 95' 18"
W04	24-inch CMP	N 32° 13' 36"	W -110° 95' 16"
W05	15-inch HDPE	N 32° 13' 36"	W -110° 95' 13"
W06	36-inch RCP	N 32° 13' 36"	W -110° 95' 09"
W07	15-inch HDPE	N 32° 13' 36"	W -110° 95' 01"
W08	15-inch HDPE	N 32° 13' 36"	W -110° 94' 97"
W09	15-inch HDPE	N 32° 13' 36"	W -110° 94' 95"
W10	48-inch RCP	N 32° 13' 36"	W -110° 94' 93"
W11	2 @ 18-inch CMP	N 32° 13' 36"	W -110° 94' 81"
W12	12-inch CMP	N 32° 13' 30"	W -110° 94' 60"
W13	2 @ 12-inch CMP	N 32° 13' 20"	W -110° 94' 57"
W14	12-inch CMP	N 32° 13' 15"	W -110° 94' 54"

**Notes:**

\* – Values are obtained from 2006 GPS survey

**CMP – Corrugated Metal Pipe****HDPE – High-Density Polyethylene****RCP – Reinforced Concrete Pipe**

807

808

809

810

811

812

813

**Representative Outfalls**

Visual monitoring of storm water discharges associated with specific industrial activities is a requirement of the AZPDES MSGP and will be performed at outfall points (discharge points) that discharge from areas where industrial materials or activities are exposed to storm water. **Those outfall points that require visual monitoring are identified in bold text in Table 2.3.** Several Base outfalls discharge runoff from areas where no industrial activities occur and no hazardous substances are stored, therefore visual monitoring is not required at those outfalls. These outfalls are listed in Table 2.3, in un-bolded text. These outfalls all discharge runoff from parking lots or rooftops that are in drainage areas that are smaller than 3 acres and completely impervious. All outfall points are shown on Figure 3 Base Site Map, included in Appendix F.

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**Table 2.3 Outfall Drainage Characteristics**

<b>OUTFALL I.D.</b>	<b>DRAINAGE BASIN</b>	<b>DRAINAGE AREA (acres)*</b>	<b>PERCENT IMPERVIOUS*</b>	<b>OFF-SITE DRAINAGE AREA (acres)</b>
<b>W 01</b>	<b>DA-01</b>	<b>30</b>	<b>100</b>	<b>15</b>
W 02	DA-02	2	100	None
<b>W 03</b>	<b>DA-03</b>	<b>7</b>	<b>90</b>	<b>None</b>
<b>W 04</b>	<b>DA-04</b>	<b>7</b>	<b>90</b>	<b>None</b>
W 05	DA-05	1	100	None
<b>W 06</b>	<b>DA-06</b>	<b>18</b>	<b>100</b>	<b>None</b>
W 07	DA-07	1	100	None
W 08	DA-08	1	100	None
W 09	DA-09	1	100	None
<b>W 10</b>	<b>DA-10</b>	<b>22</b>	<b>95</b>	<b>None</b>
<b>W 11</b>	<b>DA-11</b>	<b>7</b>	<b>95</b>	<b>None</b>
W 12	DA-12	3	100	None
<b>W 13</b>	<b>DA-13</b>	<b>4</b>	<b>100</b>	<b>None</b>
<b>W 14</b>	<b>DA-14</b>	<b>7</b>	<b>100</b>	<b>None</b>

**Notes:**

\* – Values are obtained from 2006 GPS survey.

Outfalls listed in **BOLD** text require visual monitoring.

838

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## 843 **2.5 BASE SPILL HISTORY**

844

### 845 **2.5.1 Significant Spills**

846

847 There have been two significant spills of oil or hazardous substances reported at this Base in the past  
 848 four years. On February 2, 2010 approximately 400 gallons of JP-8 was released from an aircraft  
 849 near aircraft parking spot A-19. The jet fuel was contained on the concrete ramp and recovered  
 850 using a vacuum system and absorbent materials. On December 15, 2008 approximately 6000  
 851 gallons of JP-8 was released from a primary storage tank into the surrounding secondary

162<sup>nd</sup> Fighter Wing

Tucson, AZ

February 2012

SWPPP

Page 26

Figure 3  
Base Site Map

Legend

Building Area

Covered Surface

Flow Direction

Fence

Drainage

Drainage Boundary

Spill Kit

AST

Flam CAB

Spill Location

Drainage Area ID#

Outfall ID#

DA 14

W01

N

MAP NOT TO SCALE

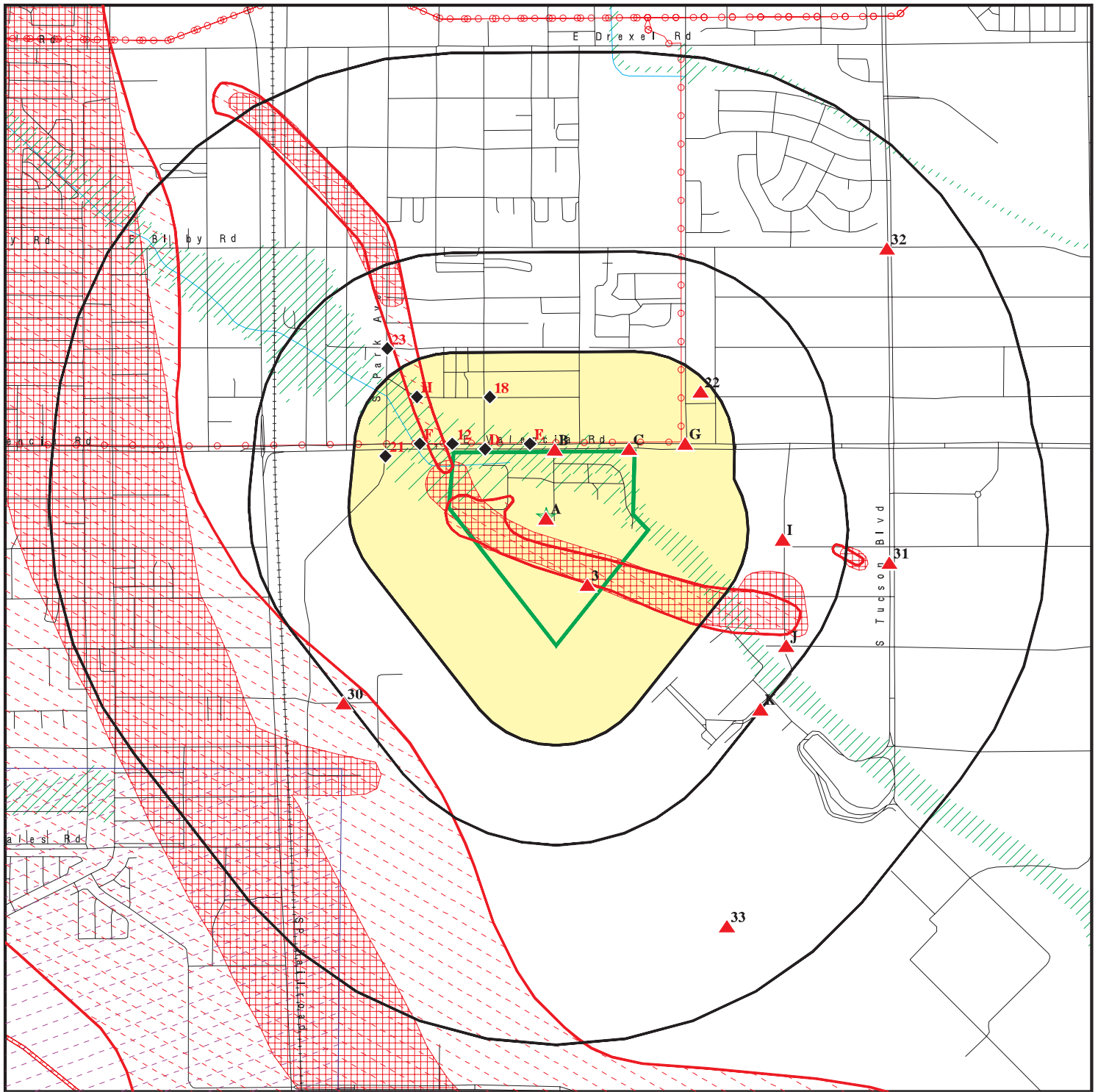
The map illustrates the layout of the Arizona Air National Guard at Tucson Installation. It features a central cluster of buildings, including the Aircraft Hangar, Vehicle Maintenance Base Supply, and various support structures. Surrounding these are parking areas, fuel storage tanks, and maintenance facilities. The map is divided into drainage areas (DA 01 to DA 14) and outfall areas (W01 to W14). Key features include the Airport Wash, Valencia Blvd, and various storage and maintenance facilities. The map is oriented with Valencia Blvd on the left and the airport wash on the right. A legend in the top left corner defines symbols for building areas, covered surfaces, flow direction, fences, drainage, spill kits, AST, flam CAB, spill locations, drainage area IDs, and outfall IDs. A north arrow is also present. The map is labeled 'MAP NOT TO SCALE'.

Sources:  
ANG CAD: Arizona Air National Guard  
at Tucson Installation Features

## **APPENDIX C-4**

### **EDR POTENTIAL ENVIRONMENTALLY SENSITIVE AREAS MAP**

# OVERVIEW MAP - 4434553.2S



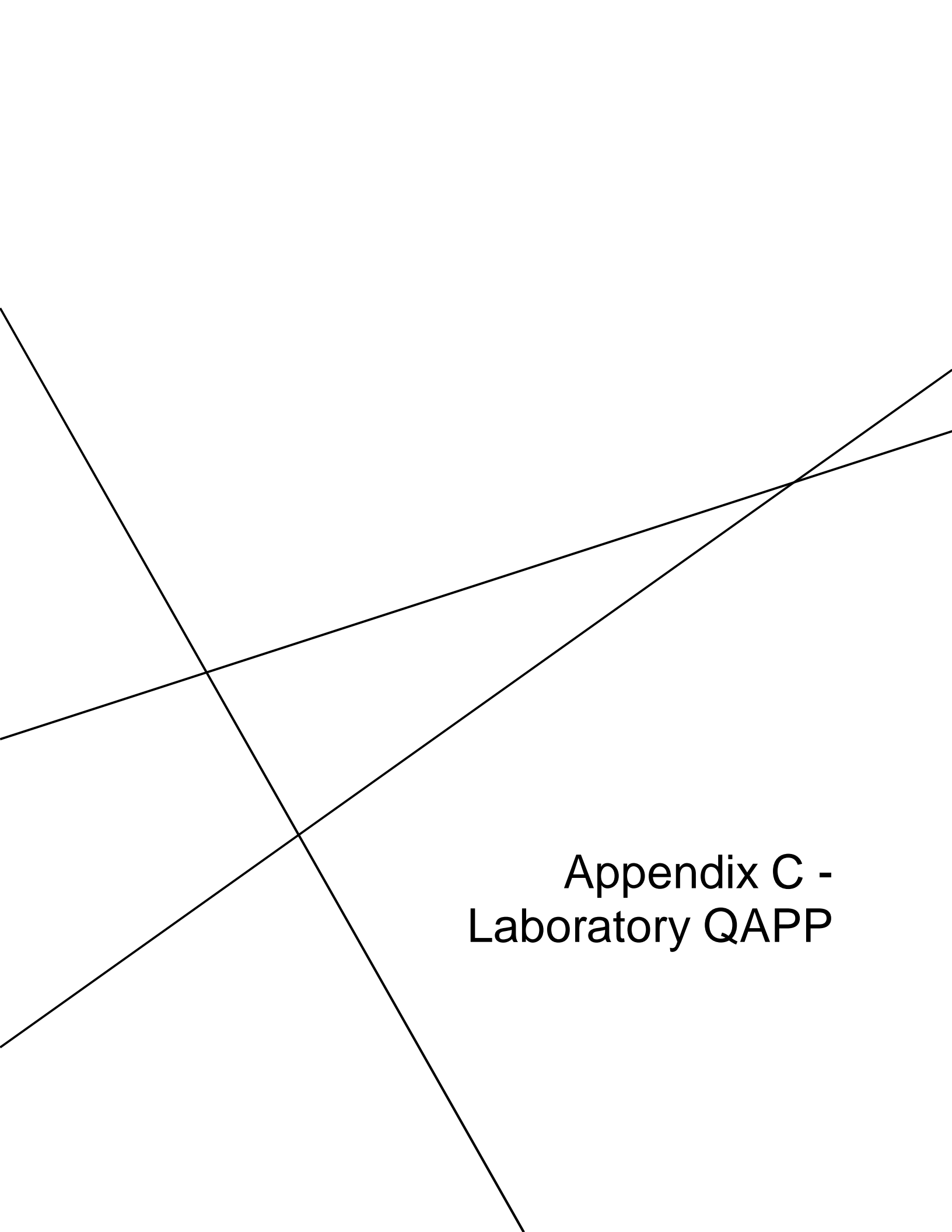
- |   |                          |  |
|---|--------------------------|--|
| Target Property   | Indian Reservations BIA  | DOD Sites: AZ DEQ                            |
| Sites at elevations higher than or equal to the target property | Power transmission lines | Water Quality Assurance Revolving Fund Areas |
| Sites at elevations lower than the target property              | Pipelines                | AZ NPL                                       |
| Manufactured Gas Plants   | 100-year flood zone      |  |
| National Priority List Sites                                    | 500-year flood zone      |  |
| Dept. Defense Sites   |                          |  |

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Tucson ANG B  
 ADDRESS: 6545 West Deuce Dr  
 Tucson AZ 85756  
 LAT/LONG: 32.1315 / 110.9494

CLIENT: B.B. & E  
 CONTACT: Naila Hosein  
 INQUIRY #: 4434553.2s  
 DATE: October 09, 2015 4:24 pm



The page features a minimalist abstract design consisting of three thin black lines that intersect to form a large triangle. One line runs diagonally from the top-left towards the bottom-right. Another line runs diagonally from the bottom-left towards the top-right. The third line runs from the left edge towards the top-right, parallel to the second line but at a higher vertical position. The text is located in the lower-right quadrant of the page.

## Appendix C - Laboratory QAPP

**Table 1. Project-Specific Laboratory QAP Crosswalk**

Please note that this is not a full QAPP, the following worksheets were completed to be a laboratory-specific Quality Assurance Plan. The table below is a Crosswalk of the worksheets completed for this Appendix. Please refer to the Work Plan for information not covered in the QAPP.


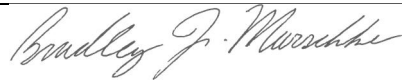



Optimized UFP-QAPP Worksheets		2106-G-05 QAPP Guidance Section		Included in Laboratory QAPP
1 & 2	Title and Approval Page	2.2.1	Title, Version, and Approval/Sign-Off	N/A- See Work Plan
3 & 5	Project Organization and QAPP Distribution	2.2.3	Distribution List	
		2.2.4	Project Organization and Schedule	
4, 7 & 8	Analytical Personnel Qualifications and Sign-Off Sheet	2.2.1	Title, Version, and Approval/Sign-Off	Chemistry Portions completed
		2.2.7	Special Training Requirements and Certification	
6	Analytical Communication Pathways	2.2.4	Project Organization and Schedule	Completed
9	Project Planning Session Summary	2.2.5	Project Background, Overview, and Intended Use of Data	N/A- See Work Plan
10	Conceptual Site Model	2.2.5	Project Background, Overview, and Intended Use of Data	
11	Project/Data Quality Objectives	2.2.6	Data/Project Quality Objectives and Measurement Performance Criteria	
12	Measurement Performance Criteria	2.2.6	Data/Project Quality Objectives and Measurement Performance Criteria	Completed
13	Secondary Data Uses and Limitations	Ch. 3	QAPP ELEMENTS FOR EVALUATING EXISTING DATA	N/A- See Work Plan
14 & 16	Project Tasks & Schedule	2.2.4	Project Organization and Schedule	
15	Project Action Limits and Laboratory-Specific Detection / Quantitation Limits	2.2.6	Data/Project Quality Objectives and Measurement Performance Criteria	Completed
17	Sampling Design and Rationale	2.3.1	Sample Collection Procedure, Experimental Design, and Sampling Tasks	N/A- See Work Plan
18	Sampling Locations and Methods	2.3.1	Sample Collection Procedure , Experimental Design, and Sampling Tasks	
		2.3.2	Sampling Procedures and Requirements	
19 & 30	Sample Containers, Preservation, and Hold Times	2.3.2	Sampling Procedures and Requirements	Completed
20	Field QC	2.3.5	Quality Control Requirements	N/A- See Work Plan
21	Field SOPs	2.3.2	Sampling Procedures and Requirements	
22	Field Equipment Calibration, Maintenance, Testing, and Inspection	2.3.6	Instrument/Equipment Testing, Calibration and Maintenance Requirements, Supplies and Consumables	
23	Analytical SOPs	2.3.4	Analytical Methods Requirements and Task Description	Completed

**Table 1. Project-Specific Laboratory QAP Crosswalk**

Optimized UFP-QAPP Worksheets		2106-G-05 QAPP Guidance Section		Included in Laboratory QAPP
24	Analytical Instrument Calibration	2.3.6	Instrument/Equipment Testing, Calibration and Maintenance Requirements, Supplies and Consumables	Completed
25	Analytical Instrument and Equipment Maintenance, Testing, and Inspection	2.3.6	Instrument/Equipment Testing, Calibration and Maintenance Requirements, Supplies and Consumables	
26 & 27	Sample Handling, Custody, and Disposal	2.3.3	Sample Handling, Custody Procedures, and Documentation	
28	Analytical Quality Control and Corrective Action	2.3.5	Quality Control Requirements	
29	Analytical Documents and Records	2.2.8	Documentation and Records Requirements	
31, 32 & 33	Analytical Assessments and Corrective Action	2.4	ASSESSMENTS AND DATA REVIEW (CHECK)	
		2.5.5	Reports to Management	
34	Data Verification and Validation Inputs	2.5.1	Data Verification and Validation Targets and Methods	
35	Data Verification Procedures	2.5.1	Data Verification and Validation Targets and Methods	
36	Data Validation Procedures	2.5.1	Data Verification and Validation Targets and Methods	
37	Data Usability Assessment	2.5.2	Quantitative and Qualitative Evaluations of Usability	N/A- See Work Plan
		2.5.3	Potential Limitations on Data Interpretation	
		2.5.4	Reconciliation with Project Requirements	

**QAPP Worksheet #4, 7 & 8: Analytical Personnel Qualifications and Sign-off Sheet**  
**(UFP-QAPP Manual Sections 2.3.2 – 2.3.4)**  
**(EPA 2106-G-05 Section 2.2.1 and 2.2.7)**

ORGANIZATION: AECOM

Name	Project Title/Role	Education/Experience	Signature/Date
Mike Myers	Project Manager	Education: B.S. Environmental Science and Policy Experience: 12 years	 02/21/2017
Brad Marschke	Field Manager	Education: BA, Geology/Geophysics Experience: 3 years	 02/21/2017
Devon Chicoine	Project Chemist/Data Manager	Education: B.S., Chemistry; M.S. Environmental Studies Experience: 15 years	 02/21/2017
Naoum Tavantzis	Project Chemist	Education: BA, Environmental Science, Masters of Business Administration Experience: 8+ Years	 02/21/2017
Dorin Bogdan	Project QA/QC Officer	Education: B.S. Civil Engineering. Ph.D Environmental and Water Resources Engineering Experience: 9 years	 02/21/2017

\*Signatures indicate personnel have read and agree to implement this QAPP as written

**QAPP Worksheet #4, 7 & 8: Analytical Personnel Qualifications and Sign-off Sheet**  
**(UFP-QAPP Manual Sections 2.3.2 – 2.3.4)**  
**(EPA 2106-G-05 Section 2.2.1 and 2.2.7)**

ORGANIZATION: Eurofins

Name	Project Title/Role	Education/Experience	Signature/Date
Kathy Klinefelter	Project Manager	Education: M.S. Physiology/with Experience: ELLE since 1993	<i>Katherine A. Klinefelter</i> 02/21/2017
Jen Lewis	Account Manager	Education: B.S. Chemistry/ with Experience: ELLE since 1985	<i>Jennifer E Lewis</i> 02/21/2017
Dorothy Love	Quality Assurance Director	Education: B.S. Environmental Experience: Health/ with ELLE since 1989	<i>Dorothy M Love</i> 02/21/2017

\*Signatures indicate personnel have read and agree to implement this QAPP as written

**QAPP Worksheet #6: Analytical Communication Pathways**  
**(UFP-QAPP Manual Section 2.4.2)**  
**(EPA 2106-G-05 Section 2.2.4)**

Communication Driver	Organization	Name	Contact Information	Procedure (timing, pathway, documentation, etc.)
Regulatory agency interface	AECOM	Mike Myers	<a href="mailto:Mike.Myers@aecom.com">Mike.Myers@aecom.com</a> 301-820-3246	Communicate technical approaches and decisions directly to regulatory agency on an as-needed basis, documented via phone records and emails.
Field progress reports	AECOM	Brad Marschke	<a href="mailto:Bradley.Marschke@aecom.com">Bradley.Marschke@aecom.com</a> 480-261-6966	All materials and information about the project will be forwarded from the AECOM PM to ANG.
Stop work due to safety issues	AECOM	Brad Marschke	<a href="mailto:Bradley.Marschke@aecom.com">Bradley.Marschke@aecom.com</a> 480-261-6966	Work may be stopped by all staff at any time for any safety concern. Notify PM of any work stoppages same day.
Analytical laboratory modifications and performance problems	AECOM	Naoum Tavantzis	<a href="mailto:Naoum.Tavantzis@aecom.com">Naoum.Tavantzis@aecom.com</a> 301-267-8761	Notify AECOM PM and QA Officer in a timely manner of performance problems encountered by the contracted analytical laboratory. PM will secure approval for modifications to the QAPP as necessary from ANG. All approved modifications will be included in Nonconformance Reports.
Field corrective actions	AECOM	Dorin Bogdan	<a href="mailto:Dorin.Bogdan@aecom.com">Dorin.Bogdan@aecom.com</a> 616-574-8383	Daily, communicate field programs reports to the AECOM PM via email with attached scanned field notes.
Sample receipt variances	Eurofins	Kathy Klinefelter	<a href="mailto:katherineklinefelter@eurofinsus.com">katherineklinefelter@eurofinsus.com</a> ; 717-556-7256	Initial response within 2 hours of contact; issue resolution based on complexity of problem
Laboratory quality control variances	Eurofins	Kathy Klinefelter	<a href="mailto:katherineklinefelter@eurofinsus.com">katherineklinefelter@eurofinsus.com</a> ; 717-556-7256	Initial response within 2 hours of contact; issue resolution based on complexity of problem
Analytical corrective actions	Eurofins	Kathy Klinefelter	<a href="mailto:katherineklinefelter@eurofinsus.com">katherineklinefelter@eurofinsus.com</a> ; 717-556-7256	Initial response within 2 hours of contact; issue resolution based on complexity of problem
Data verification issues, e.g., incomplete records	Eurofins	Kathy Klinefelter	<a href="mailto:katherineklinefelter@eurofinsus.com">katherineklinefelter@eurofinsus.com</a> ; 717-556-7256	Initial response within 2 hours of contact; issue resolution based on complexity of problem

**QAPP Worksheet #6: Analytical Communication Pathways**  
**(UFP-QAPP Manual Section 2.4.2)**  
**(EPA 2106-G-05 Section 2.2.4)**

<b>Communication Driver</b>	<b>Organization</b>	<b>Name</b>	<b>Contact Information</b>	<b>Procedure (timing, pathway, documentation, etc.)</b>
Data validation issues, e.g., non-compliance with procedures	Eurofins	Naoum Tavantzis & Devon Chicoine	<a href="mailto:Naoum.Tavantzis@aecom.com">Naoum.Tavantzis@aecom.com</a> 410-637-1629 <a href="mailto:Devon.Chicoine@aecom.com">Devon.Chicoine@aecom.com</a> 703-682-9069	Verify/validate all analytical chemistry sample results from analytical laboratories with criteria developed in this QAPP and deliver to the PM and Project QA Manager
Data review corrective actions	Eurofins	Naoum Tavantzis & Devon Chicoine	<a href="mailto:Naoum.Tavantzis@aecom.com">Naoum.Tavantzis@aecom.com</a> 410-637-1629 <a href="mailto:Devon.Chicoine@aecom.com">Devon.Chicoine@aecom.com</a> 703-682-9069	Notify Laboratory PMs to identify resolution/correction actions.

**QAPP Worksheet #12: Measurement Performance Criteria**  
**(UFP-QAPP Manual Section 2.6.2)**  
**(EPA 2106-G-05 Section 2.2.6)**

**Matrix** Water  
**Analytical Group** Perfluorinated Compounds  
**Concentration** Low

<b>Sampling Procedure</b>	<b>Analytical Method/SOP</b>	<b>Data Quality Indicators (DQI)</b>	<b>Measurement Performance Criteria</b>	<b>QC Sample and/or Activity Used to Assess Measurement Performance</b>	<b>QC Sample Assesses Error for Sampling (S), Analytical (A) or Both (S&amp;A)</b>
Water sampling	EPA 537 Rev. 1.1 modified/37-12	Precision/Accuracy/Bias	Analyte recovery limits 70-130%, RPD<30%	Laboratory Control Sample	A
Water sampling	EPA 537 Rev. 1.1 modified/37-12	Accuracy/Bias	±20% of the target ratio, which is the ion ratio in the midpoint of the calibration standard.	Ion ratio confirmation for PFOA using 2 <sup>nd</sup> SRM transition	A
Water sampling	EPA 537 Rev. 1.1 modified/37-12	Accuracy/Bias	70-130% recovery	Surrogate	A
Water sampling	EPA 537 Rev. 1.1 modified/37-12	Accuracy/Bias	At least 5 points. After calibration, each point, except the lowest, should be back calculated and be within 70-125%. The lowest point should be within 70-130%	Initial calibration standards	A
Water sampling	EPA 537 Rev. 1.1 modified/37-12	Accuracy/Lab Contamination	No analytes detected > 1/2 LOQ or >1/10 the amount measured in any sample	Method Blank	A
Water sampling	EPA 537 Rev. 1.1 modified/37-12	Accuracy/Bias	Analyte recovery limits 70-130%. RPD<30	MS/MSD	A
Water sampling	EPA 537 Rev. 1.1 modified/37-12	Sensitivity	Detection limits ≤ to PALs	Detection Limits	A
Water sampling	EPA 537 Rev. 1.1 modified/37-12	Completeness	Presentation of samples and analyses requested on COC in lab reports and EDD	Reported Sample Data	S & A
Water sampling	EPA 537 Rev. 1.1 modified/37-12	Comparability	Based on accuracy and media comparison	Use of standardized SOPs in field and laboratory	S & A



**QAPP Worksheet #12: Measurement Performance Criteria**  
**(UFP-QAPP Manual Section 2.6.2)**  
**(EPA 2106-G-05 Section 2.2.6)**

**Matrix** Soil  
**Analytical Group** Perfluorinated Compounds  
**Concentration** Low

<b>Sampling Procedure</b>	<b>Analytical Method/SOP</b>	<b>Data Quality Indicators (DQI)</b>	<b>Measurement Performance Criteria</b>	<b>QC Sample and/or Activity Used to Assess Measurement Performance</b>	<b>QC Sample Assesses Error for Sampling (S), Analytical (A) or Both (S&amp;A)</b>
Soil/Sediment sampling	EPA 537 Rev. 1.1 modified/37-12	Precision/Accuracy/Bias	Analyte recovery limits 70-130%, RPD<30%	Laboratory Control Sample	A
Soil/Sediment sampling	EPA 537 Rev. 1.1 modified/37-12	Accuracy/Bias	±20% of the target ratio, which is the ion ratio in the midpoint of the calibration standard.	Ion ratio confirmation for PFOA using 2 <sup>nd</sup> SRM transition	A
Soil/Sediment sampling	EPA 537 Rev. 1.1 modified/37-12	Accuracy/Bias	70-130% recovery	Surrogate	A
Soil/Sediment sampling	EPA 537 Rev. 1.1 modified/37-12	Accuracy/Bias	At least 5 points. After calibration, each point, except the lowest, should be back calculated and be within 70-125%. The lowest point should be within 70-130%	Initial calibration standards	A
Soil/Sediment sampling	EPA 537 Rev. 1.1 modified/37-12	Accuracy/Lab Contamination	No analytes detected > 1/2 LOQ or >1/10 the amount measured in any sample	Method Blank	A
Soil/Sediment sampling	EPA 537 Rev. 1.1 modified/37-12	Accuracy/Bias	Analyte recovery limits 70-130%, RPD<30	MS/MSD	A
Soil/Sediment sampling	EPA 537 Rev. 1.1 modified/37-12	Sensitivity	Detection limits ≤ to PALs	Detection Limits	A
Soil/Sediment sampling	EPA 537 Rev. 1.1 modified/37-12	Completeness	Presentation of samples and analyses requested on COC in lab reports and EDD	Reported Sample Data	S & A
Soil/Sediment sampling	EPA 537 Rev. 1.1 modified/37-12	Comparability	Based on accuracy and media comparison	Use of standardized SOPs in field and laboratory	S & A

**QAPP Worksheet #15: Project Action Limits and  
Laboratory-Specific Detection/Quantitation Limits  
(UFP-QAPP Manual Section 2.6.2.3 and Figure 15)  
(EPA 2106-G-05 Section 2.2.6)**

**Matrix: Groundwater**

**Analyte Group: Perfluorinated Compounds EPA Method 537 Rev. 1.1 modified**

Analyte	CAS Number	PAL (ng/L)	PAL Reference	PQL (ng/L)	Laboratory Control Spike Lower Control Limit (%)	Laboratory Control Spike Upper Control Limit (%)	Achievable Laboratory Limits		
							DL (ng/L)	LOD (ng/L)	LOQ (ng/L)
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	70	EPA 2016 <sup>(1)</sup>	7.0	70	130	2.0	6.0	6.0
Perfluorooctanoic acid (PFOA)	335-67-1	70	EPA 2016 <sup>(1)</sup>	7.0	70	130	0.60	2.0	2.0
Perfluorononanoic acid (PFNA)	375-95-1	NA	NA*	NA	70	130	0.60	2.0	2.0
Perfluorohexanesulfonate (PFHxS)	355-46-4	NA	NA*	NA	70	130	1.0	3.0	3.0
Perfluoroheptanoic acid (PFHpA)	375-85-9	NA	NA*	NA	70	130	0.50	2.0	2.0
Perfluorobutanesulfonate (PFBS)	375-73-5	80,000	EPA 2016 <sup>(2)</sup>	8,000	70	130	0.80	3.0	3.0

PQLs are ideally 1/10 regulatory standard listed

(1) EPA, 2016. Fact Sheet PFOA & PFOS Drinking Water Health Advisories. EPA 800-F-16-003. November 2016.

Provides guidance provides a health advisory level of 70 ppt for PFOS and PFOA. If both PFOS and PFOA are found to be present, the concentrations of both PFCs combined will be compared to the value of 70 ppt.

(2) Based on USEPA Drinking Water Health Advisory for PFOS and PFOA and similar adjustment to PFBS tapwater RSL of 20% contribution to exposure

\* NA = Not Available; PALs are not available for select compounds.

CAS Number = Chemical Abstracts Service Registry Number

PAL = Preliminary Action Levels

PQL = Practical Quantitation Limit

DL = Detection Limit

LOD = Limit of Detection

LOQ = Limit of Quantification

ng/L = nanograms / Liter

**QAPP Worksheet #15: Project Action Limits and  
Laboratory-Specific Detection/Quantitation Limits  
(UFP-QAPP Manual Section 2.6.2.3 and Figure 15)  
(EPA 2106-G-05 Section 2.2.6)**

**Matrix: Surface Water**

**Analyte Group: Perfluorinated Compounds EPA Method 537 Rev. 1.1 modified**

Analyte	CAS Number	PAL (ng/L)	PAL Reference	PQL (ng/L)	Laboratory Control Spike Lower Control Limit (%)	Laboratory Control Spike Upper Control Limit (%)	Achievable Laboratory Limits		
							DL (ng/L)	LOD (ng/L)	LOQ (ng/L)
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	NA	NA*	NA	70	130	2.0	6.0	6.0
Perfluorooctanoic acid (PFOA)	335-67-1	NA	NA*	NA	70	130	0.60	2.0	2.0
Perfluorononanoic acid (PFNA)	375-95-1	NA	NA*	NA	70	130	0.60	2.0	2.0
Perfluorohexanesulfonate (PFHxS)	355-46-4	NA	NA*	NA	70	130	1.0	3.0	3.0
Perfluoroheptanoic acid (PFHpA)	375-85-9	NA	NA*	NA	70	130	0.50	2.0	2.0
Perfluorobutanesulfonate (PFBS)	375-73-5	NA	NA*	NA	70	130	0.80	3.0	3.0

PQLs are ideally 1/10 regulatory standard listed

\* NA = Not Available; PALs are not available for select compounds.

CAS Number = Chemical Abstracts Service Registry Number

PAL = Preliminary Action Levels

PQL = Practical Quantitation Limit

DL = Detection Limit

LOD = Limit of Detection

LOQ = Limit of Quantification

ng/L = nanograms / Liter

**QAPP Worksheet #15: Project Action Limits and  
Laboratory-Specific Detection/Quantitation Limits  
(UFP-QAPP Manual Section 2.6.2.3 and Figure 15)  
(EPA 2106-G-05 Section 2.2.6)**

**Matrix: Soil**

**Analyte Group: Perfluorinated Compounds EPA Method 537 Rev. 1.1 modified**

Analyte	CAS Number	PAL (ng/g)	PAL Reference	PQL (ng/g)	Laboratory Control Spike Lower Control Limit (%)	Laboratory Control Spike Upper Control Limit (%)	Achievable Laboratory Limits		
							DL (ng/g)	LOD (ng/g)	LOQ (ng/g)
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	1,260	EPA RSL <sup>(1)</sup>	126	70	130	0.30	0.90	0.90
Perfluorooctanoic acid (PFOA)	335-67-1	1,260		126	70	130	0.20	0.60	0.60
Perfluorononanoic acid (PFNA)	375-95-1	NA	NA*	NA	70	130	0.10	0.40	0.40
Perfluorohexanesulfonate (PFHxS)	355-46-4	NA	NA*	NA	70	130	0.20	0.60	0.60
Perfluoroheptanoic acid (PFHpA)	375-85-9	NA	NA*	NA	70	130	0.20	0.60	0.60
Perfluorobutanesulfonate (PFBS)	375-73-5	1.26x10 <sup>6</sup>	EPA RSL <sup>(1)</sup>	1.26x10 <sup>5</sup>	70	130	0.20	0.60	0.60

PQLs are ideally 1/10 regulatory standard listed

(1) Values calculated from current version of [USEPA's Online RSL calculator , February 2017](#). Residential – Direct Contact with Soil RSLs.

Direct contact includes incidental ingestion of soil, dermal contact and outdoor inhalation of particulates

\* NA = Not Available; PALs are not available for select compounds.

CAS Number = Chemical Abstracts Service Registry Number

PAL = Preliminary Action Levels

PQL = Practical Quantitation Limit

DL = Detection Limit

LOD = Limit of Detection

LOQ = Limit of Quantification

ng/L = nanograms / Liter

**QAPP Worksheet #15: Project Action Limits and  
Laboratory-Specific Detection/Quantitation Limits  
(UFP-QAPP Manual Section 2.6.2.3 and Figure 15)  
(EPA 2106-G-05 Section 2.2.6)**

**Matrix: Sediment**

**Analyte Group: Perfluorinated Compounds EPA Method 537 Rev. 1.1 modified**

Analyte	CAS Number	PAL (ng/g)	PAL Reference	PQL (ng/g)	Laboratory Control Spike Lower Control Limit (%)	Laboratory Control Spike Upper Control Limit (%)	Achievable Laboratory Limits		
							DL (ng/g)	LOD (ng/g)	LOQ (ng/g)
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	NA	NA*	NA	70	130	0.30	0.90	0.90
Perfluorooctanoic acid (PFOA)	335-67-1	NA	NA*	NA	70	130	0.20	0.60	0.60
Perfluorononanoic acid (PFNA)	375-95-1	NA	NA*	NA	70	130	0.10	0.40	0.40
Perfluorohexanesulfonate (PFHxS)	355-46-4	NA	NA*	NA	70	130	0.20	0.60	0.60
Perfluoroheptanoic acid (PFHpA)	375-85-9	NA	NA*	NA	70	130	0.20	0.60	0.60
Perfluorobutanesulfonate (PFBS)	375-73-5	NA	NA*	NA	70	130	0.20	0.60	0.60

PQLs are ideally 1/10 regulatory standard listed

\* NA = Not Available; PALs are not available for select compounds.

CAS Number = Chemical Abstracts Service Registry Number

PAL = Preliminary Action Levels

PQL = Practical Quantitation Limit

DL = Detection Limit

LOD = Limit of Detection

LOQ = Limit of Quantification

ng/L = nanograms / Liter

**QAPP Worksheet #19 & 30: Sample Containers, Preservation, and Hold Times**  
**(UFP-QAPP Manual Section 3.1.2.2)**  
**(EPA 2106-G-05 Section 2.3.2)**

Laboratory Eurofins Lancaster Laboratories Environmental, LLC 2425 New Holland Pike Lancaster, PA 17601

attention Sample administration (Kathy Klinefelter: [KatherineKlinefelter@eurofinsus.com](mailto:KatherineKlinefelter@eurofinsus.com): 717-556-7256:

List any required accreditations/certifications: DoD/ELAP

Back-up Laboratory: N/A

Sample Delivery Method: FedEx

<b>Analyte/ Analyte Group</b>	<b>Matrix</b>	<b>Method/ SOP</b>	<b>Accreditation Expiration Date</b>	<b>Container(s) (number, size &amp; type per sample)</b>	<b>Preservation</b>	<b>Preparation Holding Time</b>	<b>Analytical Holding Time</b>	<b>Data Package Turnaround</b>
Perfluorinated Compounds	Groundwater/ Surface Water	Method 537 Rev. 1.1 modified	11/30/2018	250 mL HDPE	None, 2-6C (trizma optional)	14 days	28 days	28 days
Perfluorinated Compounds	Soil/ Sediment	Method 537 Rev. 1.1 modified	11/30/2018	250 mL HDPE	None, 2-6°C	28 days	28 days	28 days

**QAPP Worksheet #23: Analytical SOP's**  
**(UFP-QAPP Manual Section 3.2.1)**  
**(EPA 2106-G-05 Section 2.3.4)**

<b>Lab SOP Number</b>	<b>Title, Revision Date, and / or Number</b>	<b>Definitive or Screening Data</b>	<b>Matrix and Analytical Group</b>	<b>Instrument</b>	<b>Organization Performing Analysis</b>	<b>Modified for Project Work? (Y/N)</b>
37-10	SOP-SP-001... Maintenance and Tuning for Thermo Scientific TSQ Quantum Access Tandem Mass Spectrometer with a Thermo Electron Accela HPLC System (LC/MS/MS) Rev 1 1/28/2010	N/A	Maintenance	LC/MS/MS	ELLE	N
37-11	MC-SP-002... Thermo Scientific Trace Ultra Gas Chromatograph Quantum XLS Tandem Mass Spectrometer (GC/MS/MS) Preventative and Corrective Maintenance Rev 1 9/26/2011	N/A	Maintenance	LC/MS/MS	ELLE	N
37-12	10954 Perfluorinated Alkyl Substances (PFASs) in Aqueous Samples by Method 537.1 modified Using LC/MS/MS Rev. 1 10/7/2016	N/A	PFAS	LC/MS/MS	ELLE	N
37-15	14027 Perfluorinated Alkyl Substances (PFASs) in Solids by Method 537.1 modified Using LC/MS/MS Rev. 1 10/7/2016	N/A	PFAS	LC/MS/MS	ELLE	N

**QAPP Worksheet #24: Analytical Instrument Calibration**  
**(UFP-QAPP Manual Section 3.2.2)**  
**(EPA 2106-G-05 Section 2.3.6)**

<b>Instrument</b>	<b>Calibration Procedure</b>	<b>Calibration Range</b>	<b>Frequency</b>	<b>Acceptance Criteria</b>	<b>Corrective Action (CA)</b>	<b>Title/position responsible for Corrective Action</b>	<b>SOP Reference</b>
LC/MS/MS PFC Compounds in Water EPA Method 537.1 modified and LC/MS/MS PFC Compounds in Solids EPA Method 537.1 modified	Initial Calibration: Minimum of five calibration standards spanning at least a 20-fold concentration range.  Continuing Calibration: Analyze every 10 samples and at the end of the analysis sequence. Concentrations alternate between low, mid, and high levels of the calibration curve.	Spans at least a 20-fold concentration range	After continuing calibration fails. Continuing calibration checks occur every 10 samples and at the end of the analysis sequence.	Initial Calibration: Back calculated concentration of each calibration point, except CAL 1 standard, with $\pm 70$ -130% of true. CAL 1 standard back calculated concentration $\pm 50$ -150% of true value. Continuing Calibration: Target compounds $\leq 25\%$ drift. For compounds with an isotopically labeled internal standard $\leq 40\%$ drift	Recalibrate, perform instrument maintenance. If calibration does not meet method criteria, recalibrate.	ELLE analyst	37-12



**QAPP Worksheet #25: Analytical Instrument and Equipment Maintenance, Testing, and Inspection**  
**Table**  
**(UFP-QAPP Manual Section 3.2.3)**  
**(EPA 2106-G-05 Section 2.3.6)**

<b>Instrument/ Equipment</b>	<b>Maintenance Activity</b>	<b>Testing Activity</b>	<b>Inspection Activity</b>	<b>Frequency</b>	<b>Acceptance Criteria</b>	<b>Corrective Action</b>	<b>Responsible Person</b>	<b>SOP Reference</b>
LC/MS/MS	Backflush of column, injection port and pre-columns, cleaning of ion spray cone, adjustment of collision energies, others as needed	Calibration Check	Visual	As Needed	Initial calibration or calibration verification passes method specifications	Perform additional maintenance prior to instrument calibration or calibration verification	ELLE Analysts	37-10

**QAPP Worksheet #26 & 27: Sample Handling, Custody, and Disposal**  
**(UFP-QAPP Manual Section 3.3)**  
**(EPA 2106-G-05 Section 2.3.3)**

Sampling Organization: AECOM

Laboratory: Eurofins Lancaster Laboratories

Method of sample delivery (shipper/carrier): FEDEX

Number of days from reporting until sample disposal: 60 Days

Activity	Organization and title or position of person responsible for the activity	SOP reference
Sample labeling	AECOM	SOP 3-03 <i>Field Sample Numbering SAP Section 3.13</i>
Chain-of-custody form completion	AECOM	SOP 3-03 <i>Sample Chain-of-Custody</i>
Packaging	AECOM	SOP 3-04 <i>Sample Packaging and Shipping</i>
Shipping coordination	AECOM	
Sample receipt, inspection, & log-in	ELLE	SOPSA103: Environmental Sample Receipt and Unpacking; rev 13; 9/24/2014
Sample custody and storage	ELLE	SOPSS006: Automated Storage Retrieval and Discarding of Samples; rev 9; 4/22/2011
Sample disposal	ELLE	SOPSS006: Automated Storage Retrieval and Discarding of Samples; rev 9; 4/22/2011

**QAPP Worksheet #28: Analytical Quality Control and Corrective Action**  
**(UFP-QAPP Manual Section 3.4 and Tables 4,5, and 6)**  
**(EPA 2106-G-05 Section 2.3.5)**

**Matrix:** Soil & Aqueous

**Analytical Group:** Perfluorinated Compounds

**Analytical Method:** EPA Method 537 rev.1.1 Modified

**SOP Reference:** 37-10

**Certification Status:** DOD/ELAP certification

QC Check	Minimum Frequency	Acceptance Criteria	Corrective Action	Flagging Criteria	Comments
<b>Initial Calibration (ICAL) for all analytes and surrogates</b>	Minimum of 5 calibration standards to establish linearity at method set-up and after major maintenance.	Each calibration point for each analyte must calculate to be within 75-125%, except the lowest cal point which must calculate to within 70-130%.	Correct problem, then repeat ICAL.	Flagging is not appropriate.	No samples may be run until ICAL has passed. Calibration can be linear (5 standards) or quadratic (6 standards); weighting is allowed.
<b>Initial Calibration Verification (ICV)</b>	Once after each ICAL, analysis of a second source standard prior to sample analysis.	Target compounds $\leq 25\%$ drift. For compounds with an isotopically labeled internal standard $\leq 40\%$ drift	Reanalyze the ICV. If ICV fails again do system maintenance and recalibrate.	Flagging is not appropriate.	No samples may be run until calibration has been verified.
<b>Continuing Calibration Verification (CCV)</b>	Analysis of mid-level standard after every 10 field samples. All samples must be bracketed by the analysis of a standard demonstrating that the system was capable of accurately detecting and quantifying perfluorinated compounds.	Target compounds $\leq 25\%$ drift. For compounds with an isotopically labeled internal standard $\leq 40\%$ drift	Recalibrate, and reanalyze all affected samples since the last acceptable CCV; Or Immediately analyze two additional consecutive CCVs. If both pass, samples may be reported without reanalysis. If either fails, take corrective action(s) and re-calibrate; then reanalyze all affected samples since the last acceptable CCV.	If reanalysis cannot be performed, data must be qualified and explained in the case narrative. Apply Q-flag to all results for the specific analyte(s) in all samples since the last acceptable calibration verification.	Flagging is only appropriate in cases where the samples cannot be reanalyzed.

**QAPP Worksheet #28: Analytical Quality Control and Corrective Action**  
**(UFP-QAPP Manual Section 3.4 and Tables 4,5, and 6)**  
**(EPA 2106-G-05 Section 2.3.5)**

**Matrix:** Soil & Aqueous

**Analytical Group:** Perfluorinated Compounds

**Analytical Method:** EPA Method 537 rev.1.1 Modified

**SOP Reference:** 37-10

**Certification Status:** DOD/ELAP certification

QC Check	Minimum Frequency	Acceptance Criteria	Corrective Action	Flagging Criteria	Comments
<b>Internal Standard (IS)</b>	Addition of isotopically labeled analytes to every sample, batch QC sample, standard, instrument blank, and method blank.	Determine that the absolute areas of the quantitation ions of the IS(s) are within 50- 150% from the average areas measured during initial calibration.	If recoveries are acceptable for QC samples, but not field samples, the field samples may be considered to suffer from a matrix effect. For failed QC samples, correct problem, and rerun all associated failed field samples.	Apply Q-flag and discuss in the case narrative.	Failing internal standard should be thoroughly documented in the case narrative.
<b>Tune Check</b>	Prior to ICAL and after any mass calibration or maintenance is performed.	Tuning standard must contain analytes of interest or appropriate substitute. Mass assignments of tuning standard within 0.5 amu of true value.	Retune instrument. If the tuning will not meet acceptance criteria, an instrument mass calibration must be performed and the tuning redone.	Flagging is not appropriate.	Problem must be corrected. Sample analysis shall not proceed without acceptable tuning.
<b>Method Blank (MB)</b>	One per preparatory batch.	No analytes detected > 1/2 LOQ or > 1/10 the amount measured in any sample or 1/10 the regulatory limit, whichever is greater.	Correct problem. If required, reprep and reanalyze MB and all samples processed with the contaminated blank.	If reanalysis cannot be performed, data must be qualified and explained in the case narrative. Apply B-flag to all results for the specific analyte(s) in all samples in the associated preparatory batch.	Results may not be reported without a valid method blank. Flagging is only appropriate in cases where the samples cannot be reanalyzed.  Estimate detections in the method blank will be reported.

**QAPP Worksheet #28: Analytical Quality Control and Corrective Action**  
**(UFP-QAPP Manual Section 3.4 and Tables 4,5, and 6)**  
**(EPA 2106-G-05 Section 2.3.5)**

**Matrix:** Soil & Aqueous

**Analytical Group:** Perfluorinated Compounds

**Analytical Method:** EPA Method 537 rev.1.1 Modified

**SOP Reference:** 37-10

**Certification Status:** DOD/ELAP certification

<b>QC Check</b>	<b>Minimum Frequency</b>	<b>Acceptance Criteria</b>	<b>Corrective Action</b>	<b>Flagging Criteria</b>	<b>Comments</b>
<b>Laboratory Control Sample (LCS)</b>	One per preparatory batch.	See WS#15 for control limits	Reanalyze LCS and associated samples. Analytes in the LCS that fail high and are ND in the samples can be reported. All others are re-extracted	If reanalysis cannot be performed, data must be qualified and explained in the case narrative. Apply Q-flag to specific analyte(s) in all samples in the associated preparatory batch.	Results may not be reported without a valid LCS. Flagging is only appropriate in cases where the samples cannot be reanalyzed.
<b>Matrix Spike (MS)</b>	One per preparatory batch.	See WS#15 for control limits	Flag outliers	For the specific analyte(s) in the parent sample, apply J-flag if acceptance criteria are not met.	If MS results are outside the limits, the data shall be evaluated to determine the source(s) of difference, i.e., matrix effect or analytical error.
<b>Matrix Spike Duplicate (MSD) or Matrix Duplicate (MD)</b>	One per preparatory batch per matrix.	See WS#15 for control limits MS or MD: RPD of all analytes $\leq 30\%$ (between MS and MSD or sample and MD)	Flag outliers	For the specific analyte(s) in the parent sample, apply J-flag if acceptance criteria are not met.	The data shall be evaluated to determine the source of error. Analyze MS/MSD for low concentration samples and Sample/MD for high concentration samples.

**QAPP Worksheet #28: Analytical Quality Control and Corrective Action**  
**(UFP-QAPP Manual Section 3.4 and Tables 4,5, and 6)**  
**(EPA 2106-G-05 Section 2.3.5)**

**Matrix:** Soil & Aqueous

**Analytical Group:** Perfluorinated Compounds

**Analytical Method:** EPA Method 537 rev.1.1 Modified

**SOP Reference:** 37-10

**Certification Status:** DOD/ELAP certification

QC Check	Minimum Frequency	Acceptance Criteria	Corrective Action	Flagging Criteria	Comments
<b>Surrogate Spike</b>	All field and QC samples.	70-130%	Reanalyze if outside limits, if confirmed, report data with comment. If not confirmed re-extract	Apply Q-flag and discuss in the case narrative.	Alternative surrogates are recommended when there is obvious chromatographic interference.

**QAPP Worksheet #29: Analytical Project Documents and Records**  
**(UFP-QAPP Manual Section 3.5.1)**  
**(EPA 2106-G-05 Section 2.2.8)**

Sample Collection and Field Records			
Record	Generation	Verification	Storage location/archival
Field logbook or data collection sheets	Field Task Leader	Project Manager	Project File
Chain-of-Custody Forms	Field Task Leader	Project Manager	Project File
Air Bills	Field Task Leader	Project Manager	Project File
Contractor Daily QC Reports	Field Task Leader	Project Manager	Project File
Deviations	Field Task Leader	Project Manager	Project File
Corrective Action Reports	Project Manager	Program Manager	Project File
Correspondence	Project Manager	Program Manager	Project File

Project Assessments			
Record	Generation	Verification	Storage location/archival
Field audit checklists	QC Manager	Project Manager	Project File
Data verification checklists	Project Chemist	Senior Project Chemist	Project File
Data validation report	Project Chemist	Senior Project Chemist	Project File
Data usability assessment report	Project Chemist	Senior Project Chemist	Project File

Laboratory Records			
Record	Generation	Verification	Storage location/archival
Narrative	Eurofins	Project Chemist	Project File
COC	Eurofins	Project Chemist	Project File
Summary of Results	Eurofins	Project Chemist	Project File
QC Results	Eurofins	Project Chemist	Project File
Chromatograms	Eurofins	Project Chemist	Project File

Laboratory Data Deliverables	
Record	PFCs
Narrative	X
COC	X
Summary Results	X
QC Results	X
Chromatograms	X

**QAPP Worksheet #31, 32 & 33: Analytical Assessments and Corrective Action**  
**(UFP-QAPP Manual Section 4.1.1 and 4.1.2)**  
**(EPA 2106-G-05 Section 2.4 and 2.5.5)**

**Laboratory Assessments: Eurofins**

<b>Assessment Type</b>	<b>Responsible Party &amp; Organization</b>	<b>Number/Frequency</b>	<b>Estimated Dates</b>	<b>Assessment Deliverable</b>	<b>Deliverable Due Date</b>
ELAP Accreditation	A2LA	Annually	NA	Certification	NA
Data Review	Naoum Tavantzis, AECOM	Once	45 days after receipt of data	Validation Report	45 days after receipt of data
External Laboratory Audit	A2LA	Bi-annually	NA	Written Audit Report	NA
Internal Laboratory Audit	ELLE	Annually	NA	Written Audit Report	NA



**QAPP Worksheet #34: Data Verification and Validation Inputs**  
**(UFP-QAPP Manual Section 5.2.1 and Table 9)**  
**(EPA 2106-G-05 Section 2.5.1)**

Item	Description	Verification (completeness)	Validation (conformance to specifications)
<b>Planning Documents/Records</b>			
1	Approved QAPP	X	
2	Contract	X	
3	Field SOPs	X	
4	Laboratory SOPs	X	
<b>Field Records</b>			
5	Field logbooks/Daily Reports	X	
6	Equipment calibration records	X	
7	Chain-of-Custody Forms	X	X
8	Sampling diagrams/surveys	X	
9	Drilling logs	X	
10	Geophysics reports	X	
11	Relevant Correspondence	X	
12	Change orders/deviations	X	
13	Field audit reports	X	
14	Field corrective action reports	X	
15	Photographs	X	
16	Groundwater sampling forms	X	
17	Well development forms	X	
18	Water level forms	X	
19	Soil sampling forms	X	
<b>Analytical Data Package</b>			
20	Cover sheet (laboratory identifying information)	X	X
21	Case narrative	X	X
22	Internal laboratory sample transfer	X	
23	Sample receipt records	X	X
24	Sample chronology (i.e. dates and times of receipt, preparation, & analysis)	X	X
25	Communication records	X	X
26	LOD/LOQ establishment and verification	X	
27	Standards Traceability	X	
28	Instrument calibration records	X	X
29	Definition of laboratory qualifiers	X	X
30	Results reporting forms	X	X
31	QC sample results	X	X
32	Corrective action reports	X	X
33	Raw data	X	X
34	Electronic data deliverable	X	X

**QAPP Worksheet #35: Data Verification Procedures**  
**(UFP-QAPP Manual Section 5.2.2)**  
**(EPA 2106-G-05 Section 2.5.1)**

This worksheet documents procedures that will be used to verify project data. It applies to both field and laboratory records. Data verification is a completeness check to confirm that all required activities were conducted, all specified records are present, and the contents of the records are complete. As illustrated in the following example, verification often is performed at more than one step by more than one person.

<b>Records Reviewed</b>	<b>Requirement Documents</b>	<b>Process Description</b>	<b>Responsible Person, Organization</b>
Chain of custody forms and shipping forms	Chain of Custody, Shipping Documents	Chain of custody forms and shipping documentation will be reviewed internally upon their completion and verified against the packed sample coolers they represent. The shipper's signature on the chain of custody should be initialed by the reviewer, a copy of the chain of custody retained in the site file, and the original and remaining copies taped inside the cooler for shipment.	Appropriate field investigation Task Leaders for the individual medias
Review of field logbooks	Field Logbooks	Review for completeness and accuracy	Appropriate field investigation Task Leaders
Field data validation TSAs	None	N/A	N/A
Fixed laboratory analytical data review	Laboratory Data Package	Data controls are compared to this QAPP and DoD QSM v 5.0	PM or QA Manager
Fixed laboratory TSAs	Laboratory Data Package	ELAP audit and internal quality audits	QA Manager
Fixed laboratory data verification/validation	Data Validation Reports	100% data verification/validation for aqueous, soil.	AECOM Project Chemist
Fixed laboratory data validation TSAs	Data Validation Reports	Calculate and assess laboratory DQIs.	QA Manager, or designee

**QAPP Worksheet #36: Data Validation Procedures**  
**(UFP-QAPP Manual Section 5.2.2)**  
**(EPA 2106-G-05 Section 2.5.1)**

**Data Validator: AECOM**

<b>Analytical Group/Method</b>	<b>Organic Data</b>
Data deliverable requirements	ERPIMS, .csv
Analytical specifications	WS #28 & Laboratory SOP
Measurement performance criteria	WS #12, WS#15, and WS#28
Percent of data packages to be validated	100%
Percent of raw data reviewed	100%
Percent of results to be recalculated	0%
Validation procedure	<i>National Functional Guidelines for Organic Superfund Data Review</i> (EPA, 2016)
Validation code	Per Guidelines
Electronic validation program/version	The EDDs will be compared to the pdf version of the laboratory data report by AECOM. The review will be performed on 10 percent of the electronic data results. If a discrepancy is identified, the laboratory will be required to correct the error.

# **Eurofins Quality Assurance Manual & SOPs**

**\*\*\* *Laboratory SOPs are proprietary business information to be shared for review among ANG, AECOM, and federal facility regulators only \*\*\****

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## Appendix D – Field-Related SOPs

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# Standard Operation Procedures PFAS Sampling

Prepared by: AECOM Global PFAS Practice  
February 2017

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## 1 Introduction, Purpose, and Objectives

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Poly- and perfluoroalkyl substances (PFAS) are a class of hundreds of compounds that contain chains of various lengths of fluorine-carbon bonds. Fluorine-carbon bonds are one of the strongest bonds in nature; therefore, these compounds have distinct properties of strength, durability, heat-resistance and stability. PFAS are used in the manufacturing of intermediary products and hundreds of articles of commerce used in electronics, aerospace/defense, building/construction, alternative energy, automotive, semiconductors, military, healthcare, outdoor apparel/equipment and chemical/pharmaceutical manufacturing, and most notably in aqueous film forming foams (AFFF) used for fire training and firefighting (<https://fluorocouncil.com/PDFs/Infographic-FluoroTechnology-Makes-Important-Products-for-Vital-Industries-Possible.pdf>)

Included in these hundreds of articles of commerce that may contain residual PFAS are many items typically found in the sampling environment. These can be divided into two basic categories: 1) the sampling equipment and 2) the items within the sampling environment not related to the sampling equipment. The sampling equipment includes items such as bailers, pumps, tubing, sample jars and lids, gloves, sharpies, decontamination liquids and equipment, metal scoops, aluminum foil, coated field notebooks, etc. Items within the sampling environment not related to the sampling equipment include, but are not limited to, stain- and water-resistant fabrics found in outerwear and boots and in treated vehicle upholstery, personal care items, sunscreens and insect repellants, food wrappers/containers, residual fabric softeners on washed clothing, etc. What complicates evaluation of the PFAS contamination potential of items in this second category is the fact that manufacturers of these items have modified the suite of PFAS used and the amounts used in the manufacturing. In many cases, whether a specific item will be a source of PFAS contamination or not is hard to determine; as a precautionary measure, practical elimination of all of these items from the sampling environment is recommended.

Eliminating all items in the sampling environment that may be a potential source of PFAS contamination is particularly important as the various screening criteria and laboratory reporting limits for PFAS compounds are decreasing. For example, the United States Environmental protection Agency (USEPA) May, 2016, Lifetime Health Advisory for two commonly found PFAS compounds, perfluorooctanoic acid (PFOA) and perfluorosulfonic acid (PFOS), separately or combined, is 70 parts per trillion (ppt), New Jersey has a proposed drinking water MCL of 14 ppt for PFOA, and the June 2016 Australian and New Zealand Environment Conservation Council (ANZSECC) draft freshwater (ecological) guideline for PFOS is 0.23 ppt, which is below current laboratory reporting limits.

The purpose of this document is to train all qualified personnel and subcontractors who collect or otherwise handle PFAS environmental media samples or other types of samples for which PFAS analysis is required such as AFFF concentrate, protective clothing and/or concrete infrastructure (secondary containment structures, air strips, pipes, etc.) in AECOM's best practices. In addition, this document is a guidance resource that can be used along with the standard operating procedures (SOPs) for sampling media that are required to be followed for the client's project, or AECOM SOPs, if client SOP requirements do not exist. This document will supplement the AECOM-required training necessary prior to performing PFAS sampling of environmental media.

The objective of this document is to provide, in a single document, guidance on avoiding PFAS contamination during sampling of environmental media and includes the following topics:

- Safety (Section 2)
- Training and Qualifications (Section 3)
- General PFAS Sampling Guidance (Section 4)

## 2 Safety

---

As with any field mobilization, it is the responsibility of the field technical lead, Site Safety Officer (SSO), and all field personnel to be aware of the physical, chemical, and biological hazards associated with the particular site. The mitigation of potential hazards should be documented in site-specific Health and Safety Plans (HASPs) and Task Hazard Assessments (THAs) and incorporated into daily tailgate safety meetings to reinforce the message. The ubiquitous nature of PFAS presents several constraints to specific types of personal protective equipment (PPE) that are commonly used to mitigate health and safety concerns.

Field sampling occurring during extreme weather (e.g., rainfall, snowfall or extreme heat) should be conducted while wearing appropriate clothing that will not pose a risk for cross-contamination (see below Section 4.4 on Field Clothing and PPE), but will also ensure the safety of the field personnel. Sampling programs that include PFAS should take these factors into consideration during the planning phase and be aware of field conditions prior to mobilization.

While using proper sampling SOP guidance and PPE, human exposure to PFAS during sampling should be minimized. It is important to note that USEPA Lifetime Health Advisory (May, 2016) listed PFOA and PFOS as hazardous substances and PFAS and established the advisory of 70 ppt for PFOA and PFOS, separately or combined.

## 3 Training and Qualifications

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The AECOM Global PFAS Practice has prepared this written guidance document and a series of PFAS sampling training modules to guide AECOM practitioners on how to properly sample different environmental media at PFAS impacted sites:

- The prepared guidance document and training modules are for internal use only.
- The trained staff will be certified and will be responsible for ensuring that subcontractors at AECOM job sites meet AECOM sampling requirements.
- AECOM PFAS team intends to maintain a consistent practice when sampling for PFAS to avoid unnecessary cross contamination.
- Given that PFAS sampling techniques, understanding of PFAS cross contamination, PFAS analytical methods and regulatory requirements continue to evolve, this AECOM PFAS SOP will be a living document and will be revised and updated on a regular and “as needed” basis.
- Training modules may be updated and field staff may need to be re-certified in the future.

- The AECOM PFAS SOP will include the latest practice of science and engineering related to PFAS sampling, and it may be more stringent than external PFAS sampling guidance.
- AECOM PFAS project managers (PMs) are responsible for communicating with AECOM clients and implementing the PFAS sampling practice according to the client's instruction.

## 4 General PFAS Sampling Guidance

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### 4.1 Consideration of Sampling Objectives

The overarching objectives of the project will influence the fundamentals of any sampling and analysis program. It is critical that the rationale and approach to a sampling program considers the end use of the data. For instance, sampling a first flush of stagnate pipe water may be appropriate if the data collected is to be used for inclusion in a human health risk assessment as this sample will represent the worst-case scenario (i.e. not the average). It is recommended good practice to consider the project objectives when using this guidance to develop a project-specific sampling and analysis plan.

### 4.2 Materials to Avoid in the PFAS Sampling Environment

As stated in Section 1.0, there are many potential sources of PFAS cross contamination that may be found in the typical sampling environment, both in the sampling equipment and the items within the sampling environment not related to the sampling equipment. The list of these items will change based on the specific media that you are sampling.

In general, however, there are known items and material of construction that should be avoided as they have been shown to be or have the potential to be sources of PFAS cross contamination. The first list below include those materials of construction that should not be within the sampling environment and terms or phrases that AECOM personnel can check for that may indicate that a particular item may be a potential PFAS contamination source. The second list below includes materials of construction that have been proven to not be sources of potential PFAS contamination for which AECOM personnel can check for when selecting an item that will be within the sampling environment.

#### 4.2.1 Materials That Should not be in the Sampling Environment

- Polytetrafluoroethylene (PTFE)
- Teflon<sup>®</sup> and Teflon containing materials
- Low-density polyethylene (LDPE)
- Glass
- Tyvek<sup>®</sup> or coated Tyvek
- Gore-Tex<sup>®</sup>

- Decon-90
- Fluoro-surfactants
- Any item in the ingredient list that includes the term “fluoro”

#### **4.2.2 Materials that can be in the Sampling Environment**

- High-density polyethylene (HDPE)
- Polypropylene (PP)
- Polyurethane
- Polyvinyl chloride (PVC)
- Silicon
- Alconox<sup>®</sup>
- Citronex<sup>®</sup>
- Nitriles
- Liquinox<sup>®</sup>
- Neoprene
- Waxed fabric or materials
- methanol

#### **4.2.3 Items That Need to be Evaluated**

- Clothing or boots described as waterproof, water-resistant, or stain-treated
- Plumber’s tape
- Internal valves and parts of pumping equipment
- Drilling fluids

If you are unsure about an item that you are considering having in the sampling environment, please consult with the manufacturer of the item, or consult with AECOM PFAS Global Practice resource or an AECOM analytical chemist with PFAS experience prior to using the item within the sampling environment. In addition, as described in Section 4.15, it is highly recommended that an equipment blank be collected from the specific item in question prior to use in a sampling event. In addition, it may be prudent to send a section or piece of the equipment (if practical) to the laboratory for leachate analysis.

### **4.3 Equipment and Supplies**

Equipment and supplies typically used during environmental sampling may contribute PFAS contamination to the samples collected. The bullets below provide guidance on equipment to be used and avoided during PFAS sampling and handling.

- Do not use polytetrafluoroethylene (i.e., Teflon) containing materials (e.g., Teflon tubing, bailers, tape, plumbing paste, or other Teflon materials) because Teflon contains fluorinated compounds.

- Low-density polyethylene (LDPE) materials are also not acceptable for sampling.
- Before sampling, check pump materials (check valves, O-rings, and valves) for parts made of fluoropolymer materials and replace with high-density polyethylene (HDPE) parts.
- HDPE, PP, silicon materials, and stainless steel are acceptable for sampling equipment (e.g., bottles, unlined screw caps, tubing, hydrasleeves, spoons, bowls).
- Do not use waterproof field books (Rite in the Rain®) as these may contain a plastic coating or adhesive containing PFAS.
- Field notes should be documented on loose paper on Masonite or aluminum clipboards (i.e. plastic clipboards, binders, or spiral hard cover notebooks are not acceptable).
- Post-It Notes® are not allowed on project sites.
- Sharpies® and similar markers should not be used in PFAS sampling events.
- Ball point pens can be used when documenting field activities in field notebooks or on field forms, as well as, labeling sample containers and preparing chains of custody (CoC).
- Do not use chemical (blue) ice packs during the sampling program. This includes the use of ice packs for the storage of food if allowed at the site, and/or samples.
- Ziploc® bags are acceptable for use as ice containers.
- Do not use aluminum foil or recycled paper towels during sampling or sample handling.
- Do not use a vehicle with seat covers with water proofing or stain-resistant coatings such as Scotch Guard.

Again, if you are unsure about an item that you are considering having in the sampling environment, please consult with the manufacturer of the item, or consult with AECOM PFAS Global Practice resource, or an AECOM analytical chemist with PFAS experience prior to using the item within the sampling environment. In addition, as described in Section 4.15 below, it is highly recommended that an equipment blank be collected from the specific item in question prior to use in a sampling event.

#### 4.4 Field Clothing and PPE

While preparing for sampling or sample handling, be particularly suspicious of clothing and PPE that refers to waterproof, water-repellant or stain resistant characteristics as these properties may reflect the use of PFAS in the manufacture of these articles. (see Section 4.1 for a list of materials which are known to be sources of PFAS cross contamination.)

- Do not wear water-resistant, waterproof, or stain-treated clothing during the field program.
- Outerwear made of PVC or wax-coated fabrics may be worn in rainy or cold weather.
- Neoprene may be worn in situations of extreme cold.
- Field clothing made of synthetic and natural fibers (preferably cotton) are acceptable alternatives.
- Do not wear clothing or boots containing Gore-Tex while sampling or sample handling as it contains a PFAS membrane.
- All safety footwear will consist of steel-toed boots made with polyurethane and PVC.
- If the only safety footwear available is treated with water-resistant, waterproof, or stain-treated coating, then outer over boots made of PVC may be worn. The over boots must be put on and the hands washed after putting the over boots on prior to the beginning of the sampling activities. Over boots may only be removed in the staging area and after the sampling activities have been completed.
- Hip waders should be made of PVC.
- Do not wear Tyvek suits and clothing that contains Tyvek as it contains fluorinated compounds.
- Field clothing should be well laundered (a minimum of six times from time of purchase) as new clothing may be treated with PFAS-containing fabric treatments.
- Do not wear clothing that has been washed with fabric softener as fabric softeners may contain PFAS.
- In addition to water-resistant and waterproof clothing, chemical treated clothing for insect resistance and UV protection should also be avoided for PFAS sampling programs. However, this particularly poses a health and safety hazard given the prevalence of biologic hazards (e.g., ticks) and risks to prolonged sun exposure. Acceptable alternatives are provided below:
  - Field personnel should tuck pant legs into socks and/or boots and use duct tape to reduce the risk of being bitten by ticks.
  - Light colored shirts and pants should be worn to easily identify ticks during field activities.
  - Light colored clothing, long sleeves, and large-brimmed hats should also be worn to prevent sunburn.

- Additional details pertaining to acceptable personal care products (e.g., sunscreen, insect repellants) are available in Section 4.12.
- Well washed (washed six times or more) cotton coveralls may be worn over other clothing if there are concerns with items of clothing being a potential PFAS cross-contamination source. If well washed cotton coveralls are worn, they are to be donned in the staging area prior to sampling. Hands must be washed after donning the coveralls, and powderless nitrile gloves must be worn during sample collection. Coveralls must also only be removed in the staging area after the sampling event has ended.

#### **4.5 Sample Containers and Handling**

Laboratories must have demonstrated awareness and remediation of possible cross contamination from equipment and supplies in the laboratory, including the supplying sample containers appropriate for PFAS sampling.

- Powderless nitrile gloves must be worn at all times while collecting and handling samples.
- Samples should be collected in HDPE or PP bottles fitted with an unlined (no Teflon) HDPE or PP screw cap. This is an especially important point as many laboratories use Teflon-lined bottle caps.
- For larger biota sampling, Ziploc bags should be used and aluminum foil must not be used.
- For other bulk sampling of media, sample containers must be evaluated prior to use.
- LDPE should not be used for sample containers or for passive sampling.
- Glass containers should also be avoided due to potential loss of analyte through adsorption.

#### **4.6 Sample Collection**

For all sampling media, the hands must be washed prior to commencing the sampling event and clean powderless nitrile gloves must be put on prior to handling sample containers and equipment. In addition, avoid putting the sample bottle cap or lid down if possible during sample collection.

#### **4.7 Preferential Sampling Sequence**

The following text describes a strategy for collection of water samples. The same concept of collecting samples from least to most contaminated locations, if known, applies to all media.

To mitigate potential cross-contamination, drinking water, surface water, and groundwater samples are to be collected in a pre-determined order from least



impacted to more impacted based on previous analytical data. If no analytical data are available, samples are to be collected in the following order:

- Drinking water
- Surface water
- Groundwater
  - First sample the upgradient well(s).
  - Next, sample the well located furthest downgradient of the interpreted or known source.
  - The remaining wells should be progressively sampled in order from downgradient to upgradient, such that the wells closest to the interpreted or known source are sampled last.

#### **4.8 Sample Shipment**

Sample coolers should be packed with the samples in wet ice (not blue or chemical ice). The completed and relinquished CoC form should be taped to the inside of the cooler lid in a Ziploc storage bag. The cooler should be taped closed with a custody seal and shipped by overnight courier to the PFAS laboratory.

#### **4.9 Recommended Sample Holding Times**

The following guidance from EPA Method 537 is provided for drinking water samples:

- Samples must be chilled during shipment and must not exceed 10°C during the first 48 hours after collection. Sample temperature must be confirmed to be at or below 10°C when the samples are received at the laboratory. Samples stored in the laboratory must be held at or below 6°C until extraction, but should not be frozen.
- Water samples should be extracted as soon as possible but must be extracted within 14 days. Extracts must be stored at room temperature and analyzed within 28 days after extraction.

#### **4.10 General Equipment Decontamination**

It is recommended for PFAS sampling that PFAS-free disposable equipment be used. However, if equipment re-use is required, field sampling equipment that is used at each sample location will require decontamination between uses in accordance with AECOM or project field sampling SOP. However, several additional procedures should be followed by field personnel regarding decontamination when sampling for PFAS:

- Alconox, Liquinox, Citronox soap, or methanol is acceptable for use in decontamination because the Safety Data Sheets (SDS) do not list fluoro-surfactants as an ingredient.
- Decon 90 has been analyzed and shown to contain PFAS and therefore must not be used during decontamination activities.

- Prior to use, blank samples should be collected from site water supplies to be used for decontamination water to ensure that it is PFAS-free.
- Equipment to be decontaminated will be rinsed with PFAS-free water and then scrubbed using a plastic scrub brush and one of the recommended decontamination liquids listed above.
- Scrubbed equipment will then be triple rinsed with laboratory certified PFAS-free water or other available water provided it has been determined to be PFAS-free.

#### **4.11 PFAS-Free Water**

The laboratory will be asked to provide PFAS-free water to be used as final equipment rinses and to prepare field and equipment blanks during sampling (evaluating the potential for cross contamination). PFAS-free water will be demonstrated by the laboratory by analysis, for example, of method blanks.

As previously recommended, site or water from a public water supply can be used for decontamination purposes if the water has been analyzed and shown to be PFAS-free.

#### **4.12 Personnel Hygiene**

Many manufactured sunblock and insect repellants contain PFAS and should not be brought or used on-site. Some clothing alternatives to the use of sunscreen and insect repellent are provided in Section 4.4. If conditions require the use of sunblock and insect repellants, then these products should consist of 100% natural ingredients. The following products available within the United States are acceptable for use as sunscreen and/or insect repellent when sampling for PFAS:

- Sunscreens: Alba Organics Natural Sunscreen, Yes To Cucumbers, Aubrey Organics, Jason Natural Sun Block, Kiss my face, and baby sunscreens that are “free” or “natural”
- Insect Repellents: Jason Natural Quit Bugging Me, Repel Lemon Eucalyptus Insect repellent, Herbal Armor, California Baby Natural Bug Spray, BabyGanics
- Sunscreen and Insect Repellent: Avon Skin So Soft Bug Guard Plus – SPF 30 Lotion

Sunscreen and insect repellent manufactured outside of the United States must be evaluated on a case-by-case basis.

#### 4.13 Food Considerations

PFAS have commonly been used in the food packaging industry. The Food and Drug Administration in January 2016 banned the use of PFAS with eight or more carbon chains in food packaging materials. However, many food or snack products may still be packaged in wrappers treated with shorter carbon chain PFAS, which were not banned or may still contain PFAS, depending on the age of the packaging of the food item. Therefore, hands must be thoroughly washed after handling fast food, carry-out food, or snacks. Pre-wrapped food or snacks (like candy bars, microwave popcorn, etc.) must not be in the possession of field personnel on-site during sampling. Food and drinks may only be brought on-site and consumed as dictated by the HASP. When field personnel require a break to eat or drink, they should remove their gloves and coveralls, if worn, in the staging area and move to the designated area for food and beverage consumption. When finished, field personnel should wash their hands, and put their coveralls and gloves back on at the staging area, prior to returning to the work area.

#### 4.14 Laboratory Considerations

Laboratories must have the ability to analyze and report PFAS compounds using an isotope dilution method on a liquid chromatograph tandem mass spectrometer (LC-MS-MS), and demonstrate awareness and remediation of possible cross contamination from equipment and supplies in the laboratory, including the LC-MS-MS instrument.

The laboratory quality control procedures for PFAS analysis should include in each preparatory batch (1) a method blank or laboratory reagent blank to be used as a negative control sample, (2) laboratory quality control sample to be used as a positive control sample, (3) a sample matrix spike, and (4) a matrix spike or laboratory duplicate to verify the absence of significant matrix interferences as well as the precision and accuracy of quantitation in the samples matrix.

#### 4.15 Blanks

The use of blanks should be considered if unsure of the composition or suitable nature of equipment and supplies used during PFAS sampling.

- Equipment blanks should be collected by passing laboratory certified "PFAS-free" water over or through decontaminated field sampling equipment prior to the collection of samples to assess the adequacy of the decontamination process and/or to evaluate potential contamination from the equipment used during sampling. Recommended frequency is one blank/day/matrix or one blank/20 samples/matrix, whichever is more frequent. Subject to the sampling conditions, equipment blanks can be collected depending on whether dedicated sampling equipment is being used.

- Field blanks should be collected by pouring laboratory certified "PFAS-free" water into the sampling container in the field, preserving, and shipping to the laboratory with field samples. It is used to assess contamination from field conditions during sampling. Recommended frequency is one blank/day/matrix or one blank/20 samples/matrix, whichever is more frequent.
- Trip blanks should be provided by the laboratory. A laboratory certified "PFAS-free" water vial is provided by the laboratory to the sampling site and transported back to the laboratory without having been exposed to sampling procedures. Typically, a trip blank is only for volatile compounds, but it may be recommended for PFAS sampling to assess cross-contamination introduced from the laboratory and during shipping procedures. Recommended frequency is one blank/cooler containing PFAS samples.

#### **4.16 Visitors**

Visitors to the site will only be allowed if approved by the client and in accordance with the HASP and must have all necessary site training or other requirement to be on the site. Approved visitors on the site shall remain at least 30 feet from sampling areas, staging areas, and decontamination areas.

# Logbooks

## Procedure 3-02

### 1.0 Purpose and Scope

- 1.1 This standard operating procedure (SOP) describes the activities and responsibilities pertaining to the identification, use, and control of logbooks and associated field data records.
- 1.2 As guidance for specific activities, this procedure does not obviate the need for professional judgment. Deviations from this procedure while planning or executing planned activities must be approved in accordance with Program requirements for technical planning and review.

### 2.0 Safety

- 2.1 In order to keep the logbook clean, store it in a clean location and use it only when outer gloves used for PPE have been removed.

### 3.0 Terms and Definitions

#### 3.1 Logbook

A logbook is a bound field notebook with consecutively numbered, water-repellent pages that is clearly identified with the name of the relevant activity, the person assigned responsibility for maintenance of the logbook, and the beginning and ending dates of the entries.

#### 3.2 Data Form

A data form is a predetermined format utilized for recording field data that may become, by reference, a part of the logbook (e.g., soil boring logs, trenching logs, surface soil sampling logs, groundwater sample logs, and well construction logs are data forms).

### 4.0 Training and Qualifications

- 4.1 The **Project Manager** or **designee** is responsible for determining which team members shall record information in field logbooks and for obtaining and maintaining control of the required logbooks. The **Project Manager** shall review the field logbook on at least a monthly basis. The **Project Manager** or **designee** is responsible for reviewing logbook entries to determine compliance with this procedure and to ensure that the entries meet the project requirements.
- 4.2 A knowledgeable individual such as the **Site Supervisor**, **Project Manager**, or **Program Quality Manager** shall perform a technical review of each logbook at a frequency commensurate with the level of activity (weekly is suggested, or, at a minimum, monthly). Document these reviews by the dated signature of the reviewer on the last page or page immediately following the material reviewed.
- 4.3 The **Program Quality Manager** is responsible for ensuring overall compliance with this procedure.
- 4.4 The **Site Supervisor** is responsible for ensuring that all **field personnel** follow these procedures and that the logbook is completed properly and daily. The **Site Supervisor** is also responsible for submitting copies to the **Project Manager**, who is responsible for filing them and submitting a copy (if required by the Statement of Work).
- 4.5 The **logbook user** is responsible for recording pertinent data into the logbook to satisfy project requirements and for attesting to the accuracy of the entries by dated signature. The **logbook user** is also responsible for safeguarding the logbook while having custody of it.

- 4.6 All **field personnel** are responsible for the implementation of this procedure.

## 5.0 Equipment and Supplies

- 5.1 Field logbooks shall be bound field notebooks with water-repellent pages.
- 5.2 Pens shall have indelible black ink.

## 6.0 Procedure

- 6.1 The field logbook serves as the primary record of field activities. Make entries chronologically and in sufficient detail to allow the writer or a knowledgeable reviewer to reconstruct the applicable events. Store the logbook in a clean location and use it only when outer gloves used for personal protective equipment (PPE) have been removed.
- 6.2 Individual data forms may be generated to provide systematic data collection documentation. Entries on these forms shall meet the same requirements as entries in the logbook and shall be referenced in the applicable logbook entry. Individual data forms shall reference the applicable logbook and page number. At a minimum, include names of all samples collected in the logbook even if they are recorded elsewhere.
- 6.3 Enter field descriptions and observations into the logbook, as described in Attachment 1, using indelible black ink.
- 6.4 Typical information to be entered includes the following:
- Dates (month/day/year) and times (military) of all on-site activities and entries made in logbooks/forms;
  - Site name and description;
  - Site location by longitude and latitude, if known;
  - Weather conditions, including temperature and relative humidity;
  - Fieldwork documentation, including site entry and exit times;
  - Descriptions of, and rationale for, approved deviations from the work plan (WP) or field sampling plan;
  - Field instrumentation readings;
  - Names, job functions, and organizational affiliations of on-site personnel;
  - Photograph references;
  - Site sketches and diagrams made on site;
  - Identification and description of sample morphology, collection locations, and sample numbers;
  - Sample collection information, including dates (month/day/year) and times (military) of sample collections, sample collection methods and devices, station location numbers, sample collection depths/heights, sample preservation information, sample pH (if applicable), analysis requested (analytical groups), etc., as well as chain-of-custody (COC) information such as sample identification numbers cross-referenced to COC sample numbers;
  - Sample naming convention;
  - Field quality control (QC) sample information;
  - Site observations, field descriptions, equipment used, and field activities accomplished to reconstruct field operations;

- Meeting information;
- Important times and dates of telephone conversations, correspondence, or deliverables;
- Field calculations;
- PPE level;
- Calibration records;
- Contractor and subcontractor information (address, names of personnel, job functions, organizational affiliations, contract number, contract name, and work assignment number);
- Equipment decontamination procedures and effectiveness;
- Laboratories receiving samples and shipping information, such as carrier, shipment time, number of sample containers shipped, and analyses requested; and
- User signatures.

- 6.5 The logbook shall reference data maintained in other logs, forms, etc. Correct entry errors by drawing a single line through the incorrect entry, then initialing and dating this change. Enter an explanation for the correction if the correction is more than for a mistake.
- 6.6 At least at the end of each day, the person making the entry shall sign or initial each entry or group of entries.
- 6.7 Enter logbook page numbers on each page to facilitate identification of photocopies.
- 6.8 If a person's initials are used for identification, or if uncommon acronyms are used, identify these on a page at the beginning of the logbook.
- 6.9 At least weekly and preferably daily, the **preparer** shall photocopy and retain the pages completed during that session for backup. This will prevent loss of a large amount of information if the logbook is lost.

## 7.0 Quality Control and Assurance

- 7.1 Review per Section 4.2 shall be recorded.

## 8.0 Records, Data Analysis, Calculations

- 8.1 Retain the field logbook as a permanent project record. If a particular CTO requires submittal of photocopies of logbooks, perform this as required.
- 8.2 Deviations from this procedure shall be documented in field records. Significant changes shall be approved by the **Program Quality Manager**.

## 9.0 Attachments or References

- 9.1 Attachment 1 – Description of Logbook Entries
- 9.2 Department of Defense, United States (DoD). 2005. *Uniform Federal Policy for Quality Assurance Project Plans, Part 1: UFP-QAPP Manual*. Final Version 1. DoD: DTIC ADA 427785, EPA-505-B-04-900A. In conjunction with the U. S. Environmental Protection Agency and the Department of Energy. Washington: Intergovernmental Data Quality Task Force. March. On-line updates available at: [http://www.epa.gov/fedfac/pdf/ufp\\_qapp\\_v1\\_0305.pdf](http://www.epa.gov/fedfac/pdf/ufp_qapp_v1_0305.pdf).

Author	Reviewer	Revisions (Technical or Editorial)
Mark Kromis Program Chemist	Chris Barr Program Quality Manager	Rev 0 – Initial Issue



## Attachment 1

### Description of Logbook Entries

Logbook entries shall be consistent with Section A.1.4 *Field Documentation SOPs* of the UFP-QAPP Manual (DoD 2005) and contain the following information, as applicable, for each activity recorded. Some of these details may be entered on data forms, as described previously.

Name of Activity	For example, Asbestos Bulk Sampling, Charcoal Canister Sampling, Aquifer Testing.
Task Team Members and Equipment	Name all members on the field team involved in the specified activity. List equipment used by serial number or other unique identification, including calibration information.
Activity Location	Indicate location of sampling area as indicated in the field sampling plan.
Weather	Indicate general weather and precipitation conditions.
Level of PPE	Record the level of PPE (e.g., Level D).
Methods	Indicate method or procedure number employed for the activity.
Sample Numbers	Indicate the unique numbers associated with the physical samples. Identify QC samples.
Sample Type and Volume	Indicate the medium, container type, preservative, and the volume for each sample.
Time and Date	Record the time and date when the activity was performed (e.g., 0830/08/OCT/89). Use the 24-hour clock for recording the time and two digits for recording the day of the month and the year.
Analyses	Indicate the appropriate code for analyses to be performed on each sample, as specified in the WP.
Field Measurements	Indicate measurements and field instrument readings taken during the activity.
Chain of Custody and Distribution	Indicate chain-of-custody for each sample collected and indicate to whom the samples are transferred and the destination.
References	If appropriate, indicate references to other logs or forms, drawings, or photographs employed in the activity.
Narrative (including time and location)	<p>Create a factual, chronological record of the team's activities throughout the day including the time and location of each activity. Include descriptions of general problems encountered and their resolution. Provide the names and affiliations of non-field team personnel who visit the site, request changes in activity, impact the work schedule, request information, or observe team activities. Record any visual or other observations relevant to the activity, the contamination source, or the sample itself.</p> <p>It should be emphasized that logbook entries are for recording data and chronologies of events. The logbook author must include observations and descriptive notations, taking care to be objective and recording no opinions or subjective comments unless appropriate.</p>
Recorded by	Include the signature of the individual responsible for the entries contained in the logbook and referenced forms.
Checked by	Include the signature of the individual who performs the review of the completed entries.

# Recordkeeping, Sample Labeling, and Chain-of-Custody

## Procedure 3-03

### 1.0 Purpose and Scope

- 1.1 The purpose of this standard operating procedure is to establish standard protocols for all field personnel for use in maintaining field and sampling activity records, writing sample logs, labeling samples, ensuring that proper sample custody procedures are utilized, and completing chain-of-custody/analytical request forms.
- 1.2 As guidance for specific activities, this procedure does not obviate the need for professional judgment. Deviations from this procedure while planning or executing planned activities must be approved in accordance with Program requirements for technical planning and review.

### 2.0 Safety

Not applicable.

### 3.0 Terms and Definitions

#### 3.1 Logbook

A logbook is a bound field notebook with consecutively numbered, water-repellent pages that is clearly identified with the name of the relevant activity, the person responsible for maintenance of the logbook, and the beginning and ending dates of the entries.

#### 3.2 Chain-of-Custody

Chain-of-custody (COC) is documentation of the process of custody control. Custody control includes possession of a sample from the time of its collection in the field to its receipt by the analytical laboratory, and through analysis and storage prior to disposal.

### 4.0 Training and Qualifications

- 4.1 The **Project Manager** is responsible for determining which team members shall record information in the field logbook and for checking sample logbooks and COC forms to ensure compliance with these procedures. The **Project Manager** shall review COC forms on a monthly basis at a minimum.
- 4.2 The **Project Manager** and **Program Quality Manager** are responsible for evaluating project compliance with the Project Procedures Manual.
- 4.3 The **Program Quality Manager** is responsible for ensuring overall compliance with this procedure.
- 4.4 The **Laboratory Project Manager** or **Sample Control Department Manager** is responsible for reporting any sample documentation or COC problems to the **Project Manager** or **Laboratory Coordinator** within 24 hours of sample receipt.
- 4.5 The **Site Supervisor** is responsible for ensuring that all **field personnel** follow these procedures. The **Laboratory Coordinator** is responsible for verifying that the COC/analytical request forms have been completed properly and match the sampling and analysis plan. The **Project Manager** or **Laboratory Coordinator** is responsible for notifying the **laboratory, data managers, and data validators** in writing if analytical request changes are required as a corrective action. These small changes are different from change orders, which involve changes to the scope of the subcontract with

the laboratory and must be made in accordance with a respective contract (e.g., remedial action contract).

- 4.6 All **field personnel** are responsible for following these procedures while conducting sampling activities. **Field personnel** are responsible for recording pertinent data into the logbook to satisfy project requirements and for attesting to the accuracy of the entries by dated signature.

## 5.0 Procedure

This procedure provides standards for documenting field activities, labeling the samples, documenting sample custody, and completing COC/analytical request forms. The standards presented in this section shall be followed to ensure that samples collected are maintained for their intended purpose and that the conditions encountered during field activities are documented.

### 5.1 Recordkeeping

The field logbook serves as the primary record of field activities. Make entries chronologically and in sufficient detail to allow the writer or a knowledgeable reviewer to reconstruct each day's events. Field logs such as soil boring logs and ground-water sampling logs will also be used. These procedures are described in Procedure 3-02, *Logbooks*.

### 5.2 Sample Labeling

Affix a sample label with adhesive backing to each individual sample container. Place clear tape over each label (preferably prior to sampling) to prevent the labels from tearing off, falling off, being smeared, and to prevent loss of information on the label. Record the following information with a waterproof marker on each label:

- Project name or number (optional);
- COC sample number;
- Date and time of collection;
- Sampler's initials;
- Matrix (optional);
- Sample preservatives (if applicable); and
- Analysis to be performed on sample (this shall be identified by the method number or name identified in the subcontract with the laboratory).

These labels may be obtained from the analytical laboratory or printed from a computer file onto adhesive labels.

### 5.3 Custody Procedures

For samples intended for chemical analysis, sample custody procedures shall be followed through collection, transfer, analysis, and disposal to ensure that the integrity of the samples is maintained. Maintain custody of samples in accordance with the U.S. Environmental Protection Agency (EPA) COC guidelines prescribed in EPA *NEIC Policies and Procedures*, National Enforcement Investigations Center, Denver, Colorado, revised May 1986; EPA *RCRA Ground Water Monitoring Technical Enforcement Guidance Document* (TEGD); *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA OSWER Directive 9355 3-01); Appendix 2 of the *Technical Guidance Manual for Solid Waste Water Quality Assessment Test (SWAT) Proposals and Reports*; and *Test Methods for Evaluating Solid Waste* (EPA SW-846)

A description of sample custody procedures is provided below.

### 5.3.1 Sample Collection Custody Procedures

According to the U.S. EPA guidelines, a sample is considered to be in custody if one of the following conditions is met:

- It is in one's actual physical possession or view;
- It is in one's physical possession and has not been tampered with (i.e., it is under lock or official seal);
- It is retained in a secured area with restricted access; and
- It is placed in a container and secured with an official seal such that the sample cannot be reached without breaking the seal.

Place custody seals on sample containers immediately after sample collection and on shipping coolers if the cooler is to be removed from the sampler's custody. Place custody seals in such a manner that they must be broken to open the containers or coolers. Label the custody seals with the following information:

- Sampler's name or initials; and
- Date and time that the sample/cooler was sealed.

These seals are designed to enable detection of sample tampering. An example of a custody seal is shown in Attachment 1.

**Field personnel** shall also log individual samples onto COC forms (carbon copy or computer generated) when a sample is collected. These forms may also serve as the request for analyses. Procedures for completing these forms are discussed in Section 7.4, indicating sample identification number, matrix, date and time of collection, number of containers, analytical methods to be performed on the sample, and preservatives added (if any). The **samplers** will also sign the COC form signifying that they were the personnel who collected the samples. The COC form shall accompany the samples from the field to the laboratory. When a cooler is ready for shipment to the analytical laboratory, the **person delivering the samples for transport** will sign and indicate the date and time on the accompanying COC form. One copy of the COC form will be retained by the **sampler** and the remaining copies of the COC form shall be placed inside a self-sealing bag and taped to the inside of the cooler. Each cooler must be associated with a unique COC form. Whenever a transfer of custody takes place, **both parties** shall sign and date the accompanying carbon copy COC forms, and the **individual relinquishing the samples** shall retain a copy of each form. One exception is when the samples are shipped; the **delivery service personnel** will not sign or receive a copy because they do not open the coolers. The **laboratory** shall attach copies of the completed COC forms to the reports containing the results of the analytical tests. An example COC form is provided in Attachment 2.

### 5.3.2 Laboratory Custody Procedures

The following custody procedures are to be followed by an **independent laboratory** receiving samples for chemical analysis; the procedures in their Naval Facilities Engineering Service Center-evaluated Laboratory Quality Assurance Plan must follow these same procedures. A **designated sample custodian** shall take custody of all samples upon their arrival at the analytical laboratory. The **custodian** shall inspect all sample labels and COC forms to ensure that the information is consistent, and that each is properly completed. The **custodian** will also measure the temperature of the temperature blank in the coolers upon arrival using either a National Institute for Standards and Technology calibrated thermometer or an infra-red temperature gun. The **custodian** shall note the condition of the samples including:

- If the samples show signs of damage or tampering;
- If the containers are broken or leaking;
- If headspace is present in sample vials;
- If proper preservation of samples has occurred (made by pH measurement, except volatile organic compounds [VOCs] and purgeable total petroleum hydrocarbons [TPH] and temperature). The pH of VOC and purgeable TPH samples will be checked by the **laboratory analyst** after the sample aliquot has been removed from the vial for analysis; and
- If any sample holding times have been exceeded.

All of the above information shall be documented on a sample receipt sheet by the **custodian**.

Discrepancies or improper preservation shall be noted by the **laboratory** as an out-of-control event and shall be documented on an out-of-control form with corrective action taken. The out-of-control form shall be signed and dated by the **sample control custodian** and **any other persons** responsible for corrective action. An example of an out-of-control form is included as Attachment 4.

The **custodian** shall then assign a unique laboratory number to each sample and distribute the samples to secured storage areas maintained at 4 degrees Celsius (soil samples for VOC analysis are to be stored in a frozen state until analysis). The unique laboratory number for each sample, COC sample number, client name, date and time received, analysis due date, and storage shall also be manually logged onto a sample receipt record and later entered into the laboratory's computerized data management system. The **custodian** shall sign the shipping bill and maintain a copy.

**Laboratory personnel** shall be responsible for the care and custody of samples from the time of their receipt at the laboratory through their exhaustion or disposal. Samples should be logged in and out on internal laboratory COC forms each time they are removed from storage for extraction or analysis.

#### 5.4 **Completing COC/Analytical Request Forms**

COC form/analytical request form completion procedures are crucial in properly transferring the custody and responsibility of samples from field personnel to the laboratory. This form is important for accurately and concisely requesting analyses for each sample; it is essentially a release order from the analysis subcontract.

Attachment 2 is an example of a generic COC/analytical request form that may be used by **field personnel**. Multiple copies may be tailored to each project so that much of the information described below need not be handwritten each time. Attachment 3 is an example of a completed site-specific COC/analytical request form, with box numbers identified and discussed in text below.

COC forms tailored to each CTO can be drafted and printed onto multi-ply forms. This eliminates the need to rewrite the analytical methods column headers each time. It also eliminates the need to write the project manager, name, and number; QC Level; TAT; and the same general comments each time.

Complete one COC form per cooler. Whenever possible, place all VOC analyte vials into one cooler in order to reduce the number of trip blanks. Complete all sections and be sure to sign and date the COC form. One copy of the COC form must remain with the field personnel.

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Box 2 **Bill To:** List the name and address of the person/company to bill only if it is not in the subcontract with the laboratory.

Box 3 **Sample Disposal Instructions:** These instructions will be stated in the Master Service Agreement or each CTO statement of work with each laboratory.

**Shipment Method:** State the method of shipment (e.g., hand carry or air courier via FedEx or DHL).

**Comments:** This area shall be used by the field team to communicate observations, potential hazards, or limitations that may have occurred in the field or additional information regarding analysis (e.g., a specific metals list, samples expected to contain high analyte concentrations).

Box 4 **Cooler No.:** This will be written on the inside or outside of the cooler and shall be included on the COC. Some laboratories attach this number to the trip blank identification, which helps track samples for VOC analysis. If a number is not on the cooler, field personnel shall assign a number, write it on the cooler, and write it on the COC.

**QC Level:** Enter the reporting quality control (QC) requirements (e.g., Full Data Package, Summary Data Package).

**Turnaround time (TAT):** TAT will be determined by a sample delivery group (SDG), which may be formed over a 14-day period, not to exceed 20 samples. Once the SDG has been completed, standard TAT is 21 calendar days from receipt of the last sample in the SDG. Entering NORMAL or STANDARD in this field will be acceptable. If quicker TAT is required, it shall be in the subcontract with the laboratory and reiterated on each COC to remind the laboratory.

Box 5 **Type of Containers:** Write the type of container used (e.g., 1-liter glass amber, for a given parameter in that column).

**Preservatives:** Field personnel must indicate on the COC the correct preservative used for the analysis requested. Indicate the pH of the sample (if tested) in case there are buffering conditions found in the sample matrix.

Box 6 **Sample Identification (ID) Number:** This is typically a five-character alphanumeric identifier used by the contractor to identify samples. The use of this identifier is important since the laboratories are restricted to the number of characters they are able to use. Sample numbering shall be in accordance with the project-specific sampling and analysis plan.

**Description (Sample ID):** This name will be determined by the location and description of the sample, as described in the project-specific sampling and analysis plan. This sample identification should not be submitted to the laboratory, but should be left blank. If a computer COC version is used, the sample identification can be input, but printed with this block black. A cross-referenced list of the COC Sample Number and sample identification must be maintained separately.

**Date Collected:** Record the collection date in order to track the holding time of the sample. Note: For trip blanks, record the date it was placed in company with samples.

**Time Collected:** When collecting samples, record the time the sample is first collected. Use of the 24-hour military clock will avoid a.m. or p.m. designations (e.g., 1815 instead of 6:15 p.m.). Record local time; the laboratory is responsible for calculating holding times to local time.

**Lab ID:** This is for laboratory use only.

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- Box 7 **Matrix/QC:** Identify the matrix (e.g., water, soil, air, tissue, fresh water sediment, marine sediment, or product). If a sample is expected to contain high analyte concentrations (e.g., a tank bottom sludge or distinct product layer), notify the laboratory in the comment section. Mark an "X" for the sample(s) that have extra volume for laboratory QC matrix spike/matrix spike duplicate (MS/MSD) purposes. The sample provided for MS/MSD purposes is usually a field duplicate.
- Box 8 **Analytical Parameters:** Enter the parameter by descriptor and the method number desired (e.g., BTEX 8260B, PAHs 8270C, etc.). Whenever practicable, list the parameters as they appear in the laboratory subcontract to maintain consistency and avoid confusion.
- If the COC does not have a specific box for number of sample containers, use the boxes below the analytical parameter, to indicate the number of containers collected for each parameter.
- Box 9 **Sampler's Signature:** The person who collected samples must sign here.
- Relinquished By:** The person who turned over the custody of the samples to a second party other than an express mail carrier, such as FedEx or DHL, must sign and date here.
- Received By:** Typically, a representative of the receiving laboratory signs and dates here. Or, a field crew member who delivered the samples in person from the field to the laboratory might sign here. A courier, such as FedEx or DHL, does not sign here because they do not open the coolers. It must also be used by the prime contracting laboratory when samples are to be sent to a subcontractor.
- Relinquished By:** In the case of subcontracting, the primary laboratory will sign and date the Relinquished By space and fill out an additional COC to accompany the samples being subcontracted.
- Received By (Laboratory):** This space is for the final destination (e.g., at a subcontracted laboratory). A representative of the final destination (e.g., subcontracted laboratory) must sign and date here.
- Box 10 **Lab No. and Questions:** This box is to be filled in by the laboratory only.
- Box 11 **Control Number:** This number is the "COC" followed by the first contractor identification number in that cooler, or contained on that COC. This control number must be unique (i.e., never used twice). Record the date the COC is completed. It should be the same date the samples are collected.
- Box 12 **Total # of Containers:** Sum the number of containers in that row.
- Box 13 **Totals:** Sum the number of containers in each column. Because COC forms contain different formats depending on who produced the form, not all of the information listed in items 1 to 13 may be recorded; however, as much of this information as possible shall be included.
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## 6.0 Quality Control and Assurance

- 6.1 Recordkeeping, sample labeling, and chain-of-custody activities must incorporate quality control measures to ensure accuracy and completeness.
- 6.2 Deviations from this procedure or the project-specific CTO work plan shall be documented in field records. Significant changes shall be approved by the **Program Quality Manager**.

## 7.0 Records, Data Analysis, Calculations

- 7.1 The COC/analytical request form shall be faxed approximately daily to the **Laboratory Coordinator** for verification of accuracy. Following the completion of sampling activities, the sample



logbook and COC forms will be transmitted to the **Project Manager** for storage in project files. The **data validators** shall receive a copy also. The original COC/analytical request form shall be submitted by the **laboratory** along with the data delivered. Any changes to the analytical requests that are required shall be made in writing to the laboratory. A copy of this written change shall be sent to the data validators and placed in the project files. The reason for the change shall be included in the project files so that recurring problems can be easily identified.

- 7.2 Deviations from this procedure or the project-specific sampling and analysis plan shall be documented in the records. Significant changes shall be approved by the **Program Quality Manager**.

## 8.0 Attachments or References

- 8.1 Attachment 1 – Chain-of-Custody Seal
- 8.2 Attachment 2 – Generic Chain-of-Custody/Analytical Request Form
- 8.3 Attachment 3 – Sample Completed Chain-of-Custody
- 8.4 Attachment 4 – Sample Out-of-Control Form
- 8.5 Environmental Protection Agency, United States (EPA). 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*. Interim Final. EPA/540/G-89/004. Office of Emergency and Remedial Response. October.
- 8.6 EPA. 1992. *RCRA Groundwater Monitoring Draft Technical Guidance*. EPA/530/R-93/001. Office of Solid Waste. November.
- 8.7 EPA. 1997. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846. 3rd ed., Final Update IIIA. Office of Solid Waste.
- 8.8 Water Resources Control Board, State of California. 1988. *Technical Guidance Manual for Solid Waste Water Quality Assessment Test (SWAT) Proposals and Reports*. August.
- 8.9 Procedure 3-02, *Logbooks*.

Author	Reviewer	Revisions (Technical or Editorial)
Mark Kromis Program Chemist	Chris Barr Program Quality Manager	Rev 0 – Initial Issue



## Attachment 1

### Chain-of-Custody Seal

#### CHAIN-OF-CUSTODY SEAL

[LABORATORY]	SAMPLE NO.	DATE	SEAL BROKEN BY
	SIGNATURE		DATE
	PRINT NAME AND TITLE ( <i>Inspector, Analyst or Technician</i> )		

## Attachment 2

### Generic Chain-of-Custody/Analytical Request Form

[illegible]

# Attachment 3

## Sample Completed Chain-of-Custody

Chain-of-Custody										Control Number: 96H0HC205	
										Date 9 / 3 / 80 Page 1 of 1	
<b>1</b> CTO/DO Manager: Joe Smith CTO/DO Name: Former Navy Landfill CTO/DO Number: CTO 0250 <i>Deliver results to the address above or as stated in contract</i> Cooler No: 413		<b>2</b> Bill To: CLEANIRAC Contractor Company: company name Address: Oahu, Hawaii		<b>3</b> Sample Disposal by lab Shipment Method: Express Courier Comments: PACOV Level D, Measure Cooler Temperature at Lab		<b>4</b> container # (water): 1 2 2 1 2 1 2 1		<b>5</b> container # (water): 1 2 2 1 2 1 2 1		<b>6</b> GC Level: PACOV Level D TAT: Normal - per contract	
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## Attachment 4

### Sample Out-of-Control Form

<b>OUT OF CONTROL FORM</b>	Status	Date	Initial
	Noted OOC		
	Submit for CA*		
	Resubmit for CA*		
	Completed		

Date Recognized:	By:	Samples Affected (List by Accession AND Sample No.)
Dated Occurred:	Matrix	
Parameter (Test Code):	Method:	
Analyst:	Supervisor:	
1. Type of Event (Check all that apply)	2. Corrective Action (CA)* (Check all that apply)	
<input type="checkbox"/> Calibration Corr. Coefficient <0.995	<input type="checkbox"/> Repeat calibration	
<input type="checkbox"/> %RSD>20%	<input type="checkbox"/> Made new standards	
<input type="checkbox"/> Blank >MDL	<input type="checkbox"/> Reran analysis	
<input type="checkbox"/> Does not meet criteria:	<input type="checkbox"/> Sample(s) redigested and rerun	
<input type="checkbox"/> Spike	<input type="checkbox"/> Sample(s) reextracted and rerun	
<input type="checkbox"/> Duplicate	<input type="checkbox"/> Recalculated	
<input type="checkbox"/> LCS	<input type="checkbox"/> Cleaned system	
<input type="checkbox"/> Calibration Verification	<input type="checkbox"/> Ran standard additions	
<input type="checkbox"/> Standard Additions	<input type="checkbox"/> Notified	
<input type="checkbox"/> MS/MSD	<input type="checkbox"/> Other (please explain)	
<input type="checkbox"/> BS/BSD		
<input type="checkbox"/> Surrogate Recovery		
<input type="checkbox"/> Calculations Error		
<input type="checkbox"/> Holding Times Missed		
<input type="checkbox"/> Other (Please explain)	Comments:	

3. Results of Corrective Action	
<input type="checkbox"/>	Return to Control (indicated with)
<input type="checkbox"/>	Corrective Actions Not Successful - DATA IS TO BE FLAGGED with _____.

Analyst:	Date:
Supervisor:	Date:
QA Department:	Date:

# Sample Handling, Storage, and Shipping

## Procedure 3-04

### 1.0 Purpose and Scope

- 1.1 This standard operating procedure describes the actions to be used by personnel engaged in handling, storing, and transporting samples. The objective is to obtain samples of actual conditions with as little alteration as possible.
- 1.2 As guidance for specific activities, this procedure does not obviate the need for professional judgment. Deviations from this procedure while planning or executing planned activities must be approved in accordance with Program requirements for technical planning and review.

### 2.0 Safety

- 2.1 Avoid lifting heavy coolers with back muscles; instead, use leg muscles or dollies.
- 2.2 Wear proper gloves, such as blue nitrile and latex, as defined in the project-specific health and safety plan, when handling sample containers to avoid contacting any materials that may have spilled out of the sample containers.

### 3.0 Terms and Definitions

None.

### 4.0 Training and Qualifications

- 4.1 The **Project Manager** and the **Laboratory Project Manager** are responsible for identifying instances of non-compliance with this procedure and ensuring that future sample transport activities comply with this procedure.
- 4.2 The **Site Supervisor** is responsible for ensuring that all samples are shipped according to this procedure.
- 4.3 **Field personnel** are responsible for the implementation of this procedure.
- 4.4 The **Program Quality Manager** is responsible for ensuring that sample handling, storage, and transport activities conducted during all CTOs comply with this procedure.
- 4.5 All **field personnel** are responsible for the implementation of this procedure.

### 5.0 Procedure

#### 5.1 Handling and Storage

Immediately following collection, label all samples according to Procedure 3-03, *Recordkeeping, Sample Labeling, and Chain-of-Custody*. The lids of the containers shall not be sealed with duct tape, but may be covered with custody seals or placed directly into self-sealing bags. Place the sample containers in an insulated cooler with frozen gel packs (e.g., "blue ice") or ice in double, sealed self-sealing bags. Samples should occupy the lower portion of the cooler, while the ice should occupy the upper portion. Place an absorbent material (e.g., proper absorbent cloth material) on the bottom of the cooler to contain liquids in case of spillage. Fill all empty space between sample containers with Styrofoam® "peanuts" or other appropriate material. Prior to shipping, wrap glass sample containers on the sides, tops, and bottoms with bubble wrap or other appropriate padding and/or surround them in Styrofoam to

prevent breakage during transport. Pack all glass containers for water samples in an upright position, never stacked or on their sides. Prior to shipment, replace the ice or cold packs in the coolers so that samples will be maintained as close to 4 degrees Celsius (°C) as possible from the time of collection through transport to the analytical laboratory. Ship samples within 24 hours or on a schedule allowing the laboratory to meet holding times for analyses. The procedures for maintaining sample temperatures at 4°C pertain to all field samples.

## 5.2 **Shipping**

Follow all appropriate U.S. Department of Transportation regulations (e.g., 49 Code of Federal Regulations [CFR], Parts 171-179) for shipment of air, soil, water, and other samples. Elements of these procedures are summarized below.

### 5.2.1 **Hazardous Materials Shipment**

**Field personnel** must state whether any sample is suspected to be a hazardous material. A sample should be assumed hazardous unless enough evidence exists to indicate it is non-hazardous. If not suspected to be hazardous, shipments may be made as described in the Section 5.2.2 for non-hazardous materials. If hazardous, follow the procedures summarized below.

Any substance or material that is capable of posing an unreasonable risk to life, health, or property when transported is classified as hazardous. Perform hazardous materials identification by checking the list of dangerous goods for that particular mode of transportation. If not on that list, materials can be classified by checking the Hazardous Materials Table (49 CFR 172.102 including Appendix A) or by determining if the material meets the definition of any hazard class or division (49 CFR Part 173), as listed in Attachment 2.

All **persons shipping hazardous materials** must be properly trained in the appropriate regulations, as required by HM-126F, Training for Safe Transportation of Hazardous Materials (49 CFR HM-126F Subpart H). The training covers loading, unloading, handling, storing, and transporting of hazardous materials, as well as emergency preparedness in the case of accidents. **Carriers**, such as commercial couriers, must also be trained. Modes of shipment include air, highway, rail, and water.

When shipping hazardous materials, including bulk chemicals or samples suspected of being hazardous, the proper shipping papers (49 CFR 172 Subpart C), package marking (49 CFR 172 Subpart D), labeling (49 CFR 172 Subpart E), placarding (49 CFR 172 Subpart F, generally for carriers), and packaging must be used. Attachment 1 shows an example of proper package markings. Refer to a copy of 49 CFR each time hazardous materials/potentially hazardous samples are shipped.

According to Section 2.7 of the International Air Transport Association Dangerous Goods Regulations publication, very small quantities of certain dangerous goods may be transported without certain marking and documentation requirements as described in 49 CFR Part 172; however, other labeling and packing requirements must still be followed. Attachment 2 shows the volume or weight for different classes of substances. A "Dangerous Goods in Excepted Quantities" label must be completed and attached to the associated shipping cooler (Attachment 3). Certain dangerous goods are not allowed on certain airlines in any quantity.

As stated in item 4 of Attachment 4, the Hazardous Materials Regulations do not apply to hydrochloric acid (HCl), nitric acid (HNO<sub>3</sub>), sulfuric acid (H<sub>2</sub>SO<sub>4</sub>), and sodium hydroxide (NaOH) added to water samples if their pH or percentage by weight criteria is met. These samples may be shipped as non-hazardous materials as discussed below.

### 5.2.2 **Non-Hazardous Materials Shipment**

If the samples are suspected to be non-hazardous based on previous site sample results, field screening results, or visual observations, if applicable, then samples may be shipped as non-hazardous.

When a cooler is ready for shipment to the laboratory, place two copies of the chain-of-custody form inside a self-sealing bag and tape it to the inside of the insulated cooler. Then, seal the cooler with waterproof tape and label it with "Fragile," "This-End-Up" (or directional arrows pointing up), or other appropriate notices. Place chain-of-custody seals on the coolers as discussed in Procedure 3-03, *Recordkeeping, Sample Labeling, and Chain-of-Custody*.

### 5.2.3 Shipments from Outside the Continental United States

Shipment of sample coolers to the United States from locations outside the continental United States is controlled by the U.S. Department of Agriculture (USDA) and is subject to their inspection and regulation. A "USDA Soil Import Permit" is required to prove that the receiving analytical laboratory is certified by the USDA to receive and properly dispose of soil. In addition, all sample coolers must be inspected by a **USDA representative**, affixed with a label indicating that the coolers contain environmental samples, and accompanied by shipping forms stamped by the **USDA inspector** prior to shipment.

In addition, the U.S. Customs Service must clear samples shipped from U.S. territorial possessions or foreign countries upon entry into the United States. As long as the commercial invoice is properly completed (see below), shipments typically pass through U.S. Customs Service without the need to open coolers for inspection.

Completion and use of proper paperwork will, in most cases, minimize or eliminate the need for the USDA and U.S. Customs Service to inspect the contents. Attachment 5 shows an example of how paperwork may be placed on the outside of coolers for non-hazardous materials. For hazardous materials, refer to Section 5.2.1.

In summary, tape the paperwork listed below to the outside of the coolers to accompany sample shipments. If a shipment is made up of multiple pieces (e.g., more than one cooler), the paperwork need only be attached to one cooler, provided that the **courier** agrees. All other coolers in the shipment need only to be taped and have the address and chain-of-custody seals affixed.

1. **Courier Shipping Form & Commercial Invoice:** See Attachment 6 and Attachment 7 for examples of the information to be included on the commercial invoices for soil and water, respectively. Place the courier shipping form and commercial invoice inside a clear, plastic, adhesive-backed pouch that adheres to the package (typically supplied by the courier) and place it on the cooler lid as shown in Attachment 5.
2. **Soil Import Permit (soil only):** See Attachment 8 and Attachment 9 for examples of the soil import permit and soil samples restricted entry labels, respectively. The **laboratory** shall supply these documents prior to mobilization. The USDA often stops shipments of soil without these documents. Staple together the 2-inch × 2-inch USDA label (described below) and soil import permit, and place them inside a clear plastic pouch. The **courier** typically supplies the clear, plastic, adhesive-backed pouches that adhere to the package.

Placing one restricted entry label as shown in Attachment 5 (covered with clear packing tape) and one stapled to the actual permit is suggested.

The USDA does not control water samples, so the requirements for soil listed above do not apply.

3. **Chain-of-Custody Seals:** The **laboratory** should supply the seals. **CTO personnel** must sign and date these. At least two seals should be placed in such a manner that they stick to both the cooler lid and body. Placing the seals over the tape (as shown in Attachment 5), then covering it with clear packing tape is suggested. This prevents the seal from coming loose and enables detection of tampering.
4. **Address Label:** Affix a label stating the destination (laboratory address) to each cooler.
5. **Special Requirements for Hazardous Materials:** See Section 5.2.1.

Upon receipt of sample coolers at the laboratory, the **sample custodian** shall inspect the sample containers as discussed in Procedure 3-03, *Recordkeeping, Sample Labeling, and Chain-of-Custody*. The samples shall then be immediately extracted and/or analyzed, or stored in a refrigerated storage area until they are removed for extraction and/or analysis. Whenever the samples are not being extracted or analyzed, they shall be returned to refrigerated storage.

## 6.0 Quality Control and Assurance

- 6.1 Sample handling, storage, and shipping must incorporate quality control measures to ensure conformance to these and the project requirements.

## 7.0 Records, Data Analysis, Calculations

- 7.1 Maintain records as required by implementing these procedures.
- 7.2 Deviations from this procedure or the project-specific sampling and analysis plan shall be documented in field records. Significant changes shall be approved by the **Program Quality Manager**.

## 8.0 Attachments or Reference

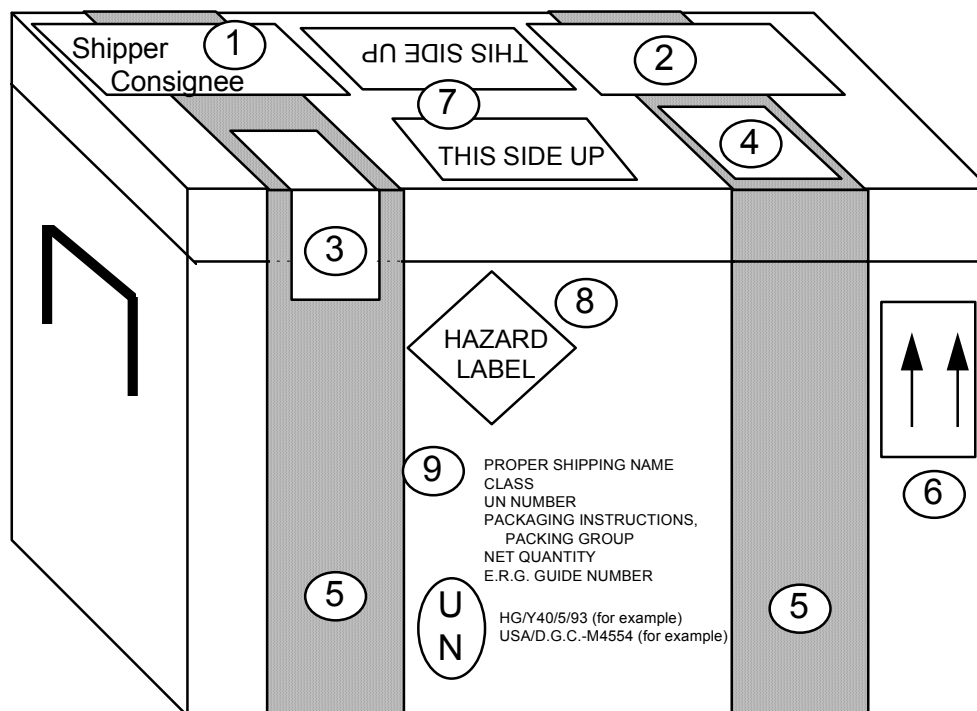
- 8.1 Attachment 1 – Example Hazardous Material Package Marking
- 8.2 Attachment 2 – Packing Groups
- 8.3 Attachment 3 – Label for Dangerous Goods in Excepted Quantities
- 8.4 Attachment 4 – SW-846 Preservative Exception
- 8.5 Attachment 5 – Non-Hazardous Material Cooler Marking Figure for Shipment from Outside the Continental United States
- 8.6 Attachment 6 – Commercial Invoice – Soil
- 8.7 Attachment 7 – Commercial Invoice – Water
- 8.8 Attachment 8 – Soil Import Permit
- 8.9 Attachment 9 – Soil Samples Restricted Entry Labels
- 8.10 Procedure 3-03, *Recordkeeping, Sample Labeling, and Chain-of-Custody*.

Author	Reviewer	Revisions (Technical or Editorial)
Mark Kromis Program Chemist	Chris Barr Program Quality Manager	Rev 0 – Initial Issue



## Attachment 1

### Example Hazardous Material Package Marking



- |  |   |
|--|---|
| ① AIR BILL/COMMERCIAL INVOICE                  | ⑥ DIRECTION ARROWS STICKER - TWO REQUIRED |
| ② USDA PERMIT (Letter to Laboratory from USDA) | ⑦ THIS SIDE UP STICKERS                   |
| ③ CUSTODY SEAL                                 | ⑧ HAZARD LABEL                            |
| ④ USDA 2" X 2" SOIL IMPORT PERMIT              | ⑨ HAZARDOUS MATERIAL INFORMATION          |
| ⑤ WATERPROOF STRAPPING TAPE                    | ⑩ PACKAGE SPECIFICATIONS                  |

## Attachment 2

### Packing Groups

PACKING GROUP OF THE SUBSTANCE	PACKING GROUP I		PACKING GROUP II		PACKING GROUP III	
CLASS or DIVISION of PRIMARY or SUBSIDIARY RISK	Packagings		Packagings		Packagings	
	Inner	Outer	Inner	Outer	Inner	Outer
1: Explosives	Forbidden <sup>(Note A)</sup>					
2.1: Flammable Gas	Forbidden <sup>(Note B)</sup>					
2.2: Non-Flammable, non-toxic gas	See Notes A and B					
2.3: Toxic gas	Forbidden <sup>(Note A)</sup>					
3: Flammable liquid	30 mL	300 mL	30 mL	500 mL	30 mL	1 L
4.1 Self-reactive substances	Forbidden		Forbidden		Forbidden	
4.1: Other flammable solids	Forbidden		30 g	500 g	30 g	1 kg
4.2: Pyrophoric substances	Forbidden		Not Applicable		Not Applicable	
4.2 Spontaneously combustible substances	Not Applicable		30 g	500 g	30 g	1 kg
4.3: Water reactive substances	Forbidden		30 g or 30 mL	500 g or 500 mL	30 g or 30 mL	1 kg or 1 L
5.1: Oxidizers	Forbidden		30 g or 30 mL	500 g or 500 mL	30 g or 30 mL	1 kg or 1 L
5.2: Organic peroxides <sup>(Note C)</sup>	See Note A		30 g or 30 mL	500 g or 250 mL	Not Applicable	
6.1: Poisons - Inhalation toxicity	Forbidden		1 g or 1 mL	500 g or 500 mL	30 g or 30 mL	1 kg or 1 L
6.1: Poisons - oral toxicity	1 g or 1 mL	300 g or 300 mL	1 g or 1 mL	500 g or 500 mL	30 g or 30 mL	1 kg or 1 L
6.1: Poisons - dermal toxicity	1 g or 1 mL	300 g or 300 mL	1 g or 1 mL	500 g or 500 mL	30 g or 30 mL	1 kg or 1 L
6.2: Infectious substances	Forbidden <sup>(Note A)</sup>					
7: Radioactive material <sup>(Note D)</sup>	Forbidden <sup>(Note A)</sup>					
8: Corrosive materials	Forbidden		30 g or 30 mL	500 g or 500 mL	30 g or 30 mL	1 kg or 1 L
9: Magnetized materials	Forbidden <sup>(Note A)</sup>					
9: Other miscellaneous materials <sup>(Note E)</sup>	Forbidden		30 g or 30 mL	500 g or 500 mL	30 g or 30 mL	1 kg or 1 L

**Note A:** Packing groups are not used for this class or division.

**Note B:** For inner packagings, the quantity contained in receptacle with a water capacity of 30 mL. For outer packagings, the sum of the water capacities of all the inner packagings contained must not exceed 1 L.

**Note C:** Applies only to Organic Peroxides when contained in a chemical kit, first aid kit or polyester resin kit.

**Note D:** See 6.1.4.1, 6.1.4.2, and 6.2.1.1 through 6.2.1.7, radioactive material in excepted packages.

**Note E:** For substances in Class 9 for which no packing group is indicated in the List of Dangerous Goods, Packing Group II quantities must be used.

## Attachment 3

### Dangerous Goods in Excepted Quantities

DANGEROUS GOODS IN EXCEPTED QUANTITIES							
<p>This package contains dangerous goods in excepted small quantities and is in all respects in compliance with the applicable international and national government regulations and the IATA Dangerous Goods Regulations.</p>							
<p>_____</p> <p>Signature of Shipper</p>							
<p>_____</p> <p>Title</p>				<p>_____</p> <p>Date</p>			
<p>_____</p> <p>Name and address of Shipper</p>							
<p>This package contains substance(s) in Class(es) (check applicable box(es))</p>							
Class:	2	3	4	5	6	8	9
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>and the applicable UN Numbers are:</p>							

## Attachment 4

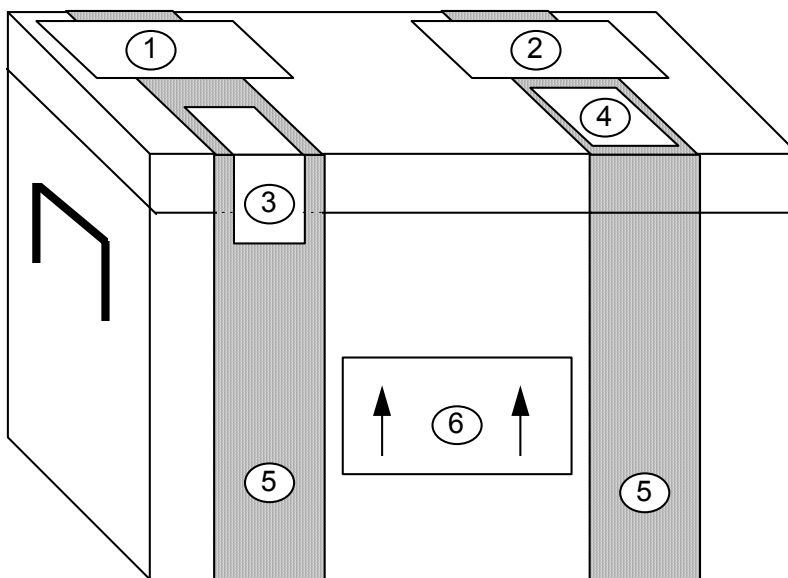
### SW-846 Preservative Exception

Measurement	Vol. Req. (mL)	Container <sup>2</sup>	Preservative <sup>3,4</sup>	Holding Time <sup>5</sup>
MBAS	250	P, G	Cool, 4°C	48 Hours
NTA	50	P, G	Cool, 4°C	24 Hours

1. More specific instructions for preservation and sampling are found with each procedure as detailed in this manual. A general discussion on sampling water and industrial wastewater may be found in ASTM, Part 31, p. 72-82 (1976) Method D-3370.
2. Plastic (P) or Glass (G). For metals, polyethylene with a polypropylene cap (no liner) is preferred.
3. Sample preservation should be performed immediately upon sample collection. For composite samples each aliquot should be preserved at the time of collection. When use of an automated sampler makes it impossible to preserve each aliquot, then samples may be preserved by maintaining at 4°C until compositing and sample splitting is completed.
4. When any sample is to be shipped by common carrier or sent through the United States Mail, it must comply with the Department of Transportation Hazardous Materials Regulations (49 CFR Part 172). The person offering such material for transportation is responsible for ensuring such compliance. for the preservation requirements of Table 1, the Office of Hazardous Materials, Materials Transportation Bureau, Department of Transportation has determined that the Hazardous Materials regulations do not apply to the following materials: Hydrochloric acid (HCl) in water solutions at concentration of 0.04% by weight or less (pH about 1.96 or greater); Nitric acid (HNO<sub>3</sub>) in water solutions at concentrations of 0.15% by weight or less (pH about 1.62 or greater); Sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) in water solutions at concentrations of 0.35% by weight or less (pH about 1.15 or greater); Sodium hydroxide (NaOH) in water solutions at concentrations of 0.080% by weight or less (pH about 12.30 or less).
5. Samples should be analyzed as soon as possible after collection. The times listed are the maximum times that samples may be held before analysis and still considered valid. Samples may be held for longer periods only if the permittee, or monitoring laboratory, has data on file to show that the specific types of sample under study are stable for the longer time, and has received a variance from the Regional Administrator. Some samples may not be stable for the maximum time period given in the table. A permittee, or monitoring laboratory, is obligated to hold the sample for a shorter time if knowledge exists to show this is necessary to maintain sample stability.
6. Should only be used in the presence of residual chlorine.

## Attachment 5

### Non-Hazardous Material Cooler Marking Figure for Shipment from Outside the Continental United States



- ① AIR BILL/COMMERCIAL INVOICE
- ② USDA PERMIT (Letter to Laboratory from USDA)
- ③ CUSTODY SEAL
- ④ USDA 2" X 2" SOIL IMPORT PERMIT
- ⑤ WATERPROOF STRAPPING TAPE
- ⑥ DIRECTION ARROWS STICKER - TWO REQUIRED

## Attachment 6

### Commercial Invoice – Soil

DATE OF EXPORTATION 1/1/94				EXPORT REFERENCES (i.e., order no., invoice no., etc.) <CJO #>				
SHIPPER/EXPORTER (complete name and address) Joe Smith Ogden c/o <hotel name> <hotel address>				CONSIGNEE Sample Receipt <Lab Name> <Lab Address>				
COUNTRY OF EXPORT Guam, UDA				IMPORTER - IF OTHER THAN CONSIGNEE				
COUNTRY OF ORIGIN OF GOODS Guam, UDA								
COUNTRY OF ULTIMATE DESTINATION UDA								
INTERNATIONAL AIR WAYBILL NO.				<div style="border: 1px solid black; width: 200px; height: 30px; margin: 0 auto;"></div> (NOTE: All shipments must be accompanied by a Federal Express International Air Waybill)				
MARKS/NOS	NO. OF PKGS	TYPE OF PACKAGING	FULL DESCRIPTION OF GOODS	QTY	UNIT OF MEASURE	WEIGHT	UNIT VALUE	TOTAL VALUE
	3	coolers	Soil samples for laboratory analysis only				\$1.00	\$3.00
		TOTAL NO. OF PKGS.				TOTAL WEIGHT		TOTAL INVOICE VALUE
		3						\$3.00
Check one <input type="checkbox"/> F.O.B. <input type="checkbox"/> C&F <input type="checkbox"/> C.I.F.								

THESE COMMODITIES ARE LICENSED FOR THE ULTIMATE DESTINATION SHOWN.

DIVERSION CONTRARY TO UNITED STATES LAW IS PROHIBITED.

I DECLARE ALL THE INFORMATION CONTAINED IN THIS INVOICE TO BE TRUE AND CORRECT

SIGNATURE OF SHIPPER/EXPORTER (Type name and title and sign)

Joe Smith, Ogden

*Joe Smith*

1/1/94

Name/Title

Signature

Date

## Attachment 7

### Commercial Invoice – Water

DATE OF EXPORTATION <i>1/1/94</i>				EXPORT REFERENCES (i.e., order no., invoice no., etc.) <CJO #>				
SHIPPER/EXPORTER (complete name and address) <i>Joe Smith</i> <i>Ogden</i> c/o <hotel name> <hotel address>				CONSIGNEE <i>Sample Receipt</i> <Lab Name> <Lab Address>				
COUNTRY OF EXPORT <i>Guam, USA</i>				IMPORTER - IF OTHER THAN CONSIGNEE				
COUNTRY OF ORIGIN OF GOODS <i>Guam, USA</i>								
COUNTRY OF ULTIMATE DESTINATION <i>USA</i>								
INTERNATIONAL AIR WAYBILL NO.				<div style="border: 1px solid black; width: 200px; height: 30px; margin: 0 auto;"></div> (NOTE: All shipments must be accompanied by a Federal Express International Air Waybill)				
MARKS/NOS	NO. OF PKGS	TYPE OF PACKAGING	FULL DESCRIPTION OF GOODS	QTY	UNIT OF MEASURE	WEIGHT	UNIT VALUE	TOTAL VALUE
	<i>3</i>	<i>coolers</i>	<i>Water samples for laboratory analysis only</i>				<i>\$1.00</i>	<i>\$3.00</i>
						TOTAL WEIGHT	TOTAL INVOICE VALUE	
							<i>\$3.00</i>	
Check one <input type="checkbox"/> F.O.B. <input type="checkbox"/> C&F <input type="checkbox"/> C.I.F.								

THESE COMMODITIES ARE LICENSED FOR THE ULTIMATE DESTINATION SHOWN.

DIVERSION CONTRARY TO UNITED STATES LAW IS PROHIBITED.

I DECLARE ALL THE INFORMATION CONTAINED IN THIS INVOICE TO BE TRUE AND CORRECT


SIGNATURE OF SHIPPER/EXPORTER (Type name and title and sign)

Joe Smith, Ogden

*Joe Smith*

*1/1/94*

# Attachment 8 Soil Import Permit

 <p><b>UNITED STATES DEPARTMENT OF AGRICULTURE</b></p> <p>Animal and Plant Health Inspection Service</p> <p>Plant Protection and Quarantine</p>	<h2 style="margin: 0;">Soil Permit</h2> <p><b>Issued To:</b></p> <p>Columbia Analytical Services (Lee Wolf) 1317 S. 13th Avenue Kelso, Washington 98626</p> <p>TELEPHONE: (360) 577-7222</p>	<p>Permit Number: S-52239</p>	<p>Under the authority of the Federal Plant Pest Act of May 23, 1957, permission is hereby granted to the facility/individual named above subject to the following conditions:</p> <ol style="list-style-type: none"> <li>1. Valid for shipments of soil not heat treated at the port of entry, only if a compliance agreement (PPQ Form 519) has been completed and signed. Compliance Agreements and Soil permits are non-transferable. If you hold a Soil Permit and you leave your present employer or company, you must notify your local USDA office promptly.</li> <li>2. To be shipped in sturdy, leakproof, containers.</li> <li>3. To be released without treatment at the port of entry.</li> <li>4. To be used only for analysis and only in the facility of the permittee at Columbia Analytical Services, located in Kelso, Washington.</li> <li>5. No use of soil for growing purposes is authorized, including the isolation or culture of organisms imported in soil.</li> <li>6. All unconsumed soil containers, and effluent is to be autoclaved, incinerated, or heat treated by the permittee at the conclusion of the project as approved and prescribed by Plant Protection and Quarantine.</li> <li>7. This permit authorizes shipments from all foreign sources, including Guam, Hawaii, Puerto Rico, and the U.S. Virgin Islands through any U.S. port of entry.</li> </ol>
		<p>JUNE 30, 2006</p> <p>Expiration Date</p>	<p><i>Deborah M. Knott</i></p> <p>Approving Official DEBORAH M. KNOTT</p>
<p><b>WARNING:</b> Any alteration, forgery, or unauthorized use of this Federal form is subject to civil penalties of up to \$250,000 (7 U.S.C. s 7754(b)) or punishable by a fine of not more than \$10,000, or imprisonment of not more than 5 years, or both (18 U.S.C. s 1001).</p>			<p>Pt. 1 - PERMITTEE</p>



## Attachment 9

### Soil Samples Restricted Entry Labels

<p><b>U.S. DEPARTMENT OF AGRICULTURE</b></p> <p><b>ANIMAL AND PLANT HEALTH INSPECTION</b></p> <p><b>SERVICE</b></p> <p><b>PLANT PROTECTION AND QUARANTINE</b></p> <p><b>HYATTSVILLE, MARYLAND 20782</b></p> <p><b>SOIL SAMPLES</b></p> <p><b>RESTRICTED ENTRY</b></p> <p>The material contained in this package is imported under authority of the Federal Plant Pest Act of May 23, 1957.</p> <p>For release without treatment if addressee is currently listed as approved by Plant Protection and Quarantine.</p> <p>PPQ FORM 550      <i>Edition of 12/77 may be used</i></p> <p>(JAN 83)</p>
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# Investigation-Derived Waste Management

## Procedure 3-05

### 1.0 Purpose and Scope

This standard operating procedure (SOP) describes activities and responsibilities of the United States Army Corp of Engineers (USACE), New England District, with regard to management of investigation-derived waste (IDW).

The purpose of this procedure is to provide guidance for the minimization, handling, labelling, temporary storage, inventory, classification, and disposal of IDW generated under the ER Program. This procedure will also apply to personal protective equipment (PPE), sampling equipment, decontamination fluids, non-IDW trash, non-indigenous IDW, and hazardous waste generated during implementation of removal or remedial actions. The information presented will be used to prepare and implement work plans (WPs) for IDW-related field activities. The results from implementation of WPs will then be used to develop and implement final IDW disposal plans.

If there are procedures whether it be from AECOM, state and/or federal that are not addressed in this SOP and are applicable to IDW then those procedures may be added as an appendix to the project specific SAP.

This procedure shall serve as management-approved professional guidance and is consistent with protocol in the Uniform Federal Policy-Quality Assurance Project Plan (DoD 2005). As professional guidance for specific activities, this procedure is not intended to obviate the need for professional judgment during unforeseen circumstances. Deviations from this procedure while planning or executing planned activities must be approved by both the Project Manager and the Quality Assurance (QA) Manager or Technical Director, and documented.

This procedure was developed to serve as management-approved professional guidance for the management of IDW generated. It focuses on the requirements for minimizing, segregating, handling, labeling, storing, and inventorying IDW in the field. Certain drum inventory requirements related to the screening, sampling, classification, and disposal of IDW are also noted in this procedure.

### 2.0 Safety

The health and safety considerations for the work associated with this SOP, including both potential physical and chemical hazards, will be addressed in the project Accident Prevention Plan (APP). In the absence of a APP, work will be conducted according to the WP and/or direction from the **Site Safety and Health Officer (SSHO)**.

All **Field Personnel** responsible for IDW management must adhere to the APP and must wear the PPE specified in the site-specific APP. Generally, this includes, at a minimum, steel-toed boots or steel-toed rubber boots, safety glasses, American National Standards Institute-standard hard hats, and hearing protection (if heavy equipment is in operation). If safe alternatives are not achievable, discontinue site activities immediately.

### 3.0 Terms and Definitions

None.

## 4.0 Training and Qualifications

- 4.1 The **Project Manager** is responsible for ensuring that IDW management activities comply with this procedure. The **Project Manager** is responsible for ensuring that all personnel involved in IDW management shall have the appropriate education, experience, and training to perform their assigned tasks.
- 4.2 The **Program Quality Manager** is responsible for ensuring overall compliance with this procedure.
- 4.3 The **Site Supervisor** is responsible for ensuring that all IDW is managed according to this procedure.
- 4.4 All **Field Personnel** are responsible for the implementation of this procedure.

## 5.0 Equipment and Supplies

The equipment and supplies required for implementation of this SOP include the following:

- Containers for waste (e.g., [U.S. Department of Transportation] DOT approved 55-gallon open and closed top drums) and material to cover waste to protect from weather (e.g., plastic covering);
- Hazardous /non-hazardous waste drum labels (weatherproof);
- Permanent marking pens;
- Inventory forms for project file;
- Plastic garbage bags, zip lock storage bags, roll of plastic sheeting; and
- Steel-toed boots, chemical resistant gloves, coveralls, safety glasses, and any other PPE required in the HASP.

## 6.0 Procedure

The following procedures are used to handle the IDW.

### 6.1 Drum Handling

- 6.1.1 IDW shall be containerized using DOT approved drums. The drums shall be made of steel or plastic, have a 55-gallon capacity, be completely painted or opaque, and have removable lids (i.e., United Nations Code 1A2 or 1H2). Typically 55-gallon drums are used, however small drums may be used depending on the amount of waste generated. New steel drums are preferred over recycled drums.
- 6.1.2 Recycled drums should not be used for hazardous waste, PCBs or other regulated shipments. For short-term storage of liquid IDW prior to discharge, double-walled bulk steel or plastic storage tanks may be used. For this scenario, consider the scheduling and cost-effectiveness of this type of bulk storage, treatment, and discharge system versus longer-term drum storage.
- 6.1.3 For long-term IDW storage at other project locations, the DOT approved drums with removable lids are recommended. Verify the integrity of the foam or rubber sealing ring located on the underside of some drum lids prior to sealing drums containing IDW liquids.
- 6.1.4 If the ring is only partially attached to the drum lid, or if a portion of the ring is missing, select another drum lid with a sealing ring that is in sound condition.
- 6.1.5 To prepare IDW drums for labeling, wipe clean the outer wall surfaces and drum lids of all material that might prevent legible and permanent labeling. If potentially contaminated material adheres to the outer surface of a drum, wipe that material from the drum, and segregate the paper towel or rag used to remove the material with visibly soiled PPE and

disposable sampling equipment. Label all IDW drums and place them on pallets prior to storage.

## 6.2 Labeling

- 6.2.1 Containers used to store IDW must be properly labelled. Two general conditions exist: 1) from previous studies or on-site data, waste characteristics are known to be either hazardous or nonhazardous; or 2) waste characteristics are unknown until additional data are obtained.
- 6.2.2 For situations where the waste characteristics are known, the waste containers should be packaged and labelled in accordance with state regulations and any federal regulations that may govern the labelling of waste.
- 6.2.3 The following information shall be placed on all non-hazardous waste labels:
- Description of waste (i.e., purge water, soil cuttings);
  - Contact information (i.e., contact name and telephone number);
  - Date when the waste was first accumulated.
- 6.2.4 The following information shall be placed on all hazardous waste labels:
- Description of waste (i.e., purge water, soil cuttings);
  - Generator information (i.e., name, address, contact telephone number);
  - EPA identification number (supplied by on-site client representative);
  - Date when the waste was first accumulated.
- 6.2.5 When the final characterization of a waste is unknown, a notification label should be placed on the drum with the words "waste characterization pending analysis" and the following information included on the label:
- Description of waste (i.e., purge water, soil cuttings);
  - Contact information (i.e., contact name and telephone number);
  - Date when the waste was first accumulated.
- 6.2.6 Once the waste has been characterized, the label should be changed as appropriate for a nonhazardous or hazardous waste.
- 6.2.7 Waste labels should be constructed of a weatherproof material and filled out with a permanent marker to prevent being washed off or becoming faded by sunlight. It is recommended that waste labels be placed on the side of the container, since the top is more subject to weathering. However, when multiple containers are accumulated together, it also may be helpful to include labels on the top of the containers to facilitate organization and disposal.
- 6.2.8 Each container of waste generated shall be recorded in the field notebook used by the person responsible for labelling the waste. After the waste is disposed of, either by transportation off-site or disposal on-site in an approved disposal area, an appropriate record shall be made in the same field notebook to document proper disposition of IDW.

### 6.3 Types of Site Investigation Waste

Several types of waste are generated during site investigations that may require special handling. These include solid, liquid, and used PPE, as discussed further below.

#### Solid Waste

Soil cuttings from boreholes will typically be placed in containers unless site specific requirements allow for soil cuttings to be placed back into the borehole after drilling is complete. Drilling mud generated during investigation activities shall be collected in containers. Covers should be included on the containers and must be secured at all times and only open during filling activities. The containers shall be labelled in accordance with this SOP. An inventory containing the source, volume, and description of material put in the containers shall be logged on prescribed forms and kept in the project file.

Non-hazardous solid waste can be disposed on-site in the designated site landfill or in a designated evaporation pond if it is liquefied. Hazardous wastes must be disposed off-site at an approved hazardous waste landfill.

#### Liquid Waste

Groundwater generated during monitoring well development, purging, and sampling can be collected in truck-mounted containers and/or other transportable containers (i.e., 55-gallon drums). Lids or bungs on drums must be secured at all times and only open during filling or pumping activities. The containers shall be labelled in accordance with this SOP. Non-hazardous liquid waste can be disposed of in one of the designated lined evaporation ponds on-site. Hazardous wastes must be handled separately and disposed off-site at an approved hazardous waste facility.

#### Personal Protective Equipment

PPE that is generated throughout investigation activities shall be placed in plastic garbage bags. If the solid or liquid waste that was being handled is characterized as hazardous waste, then the corresponding PPE should also be disposed as hazardous waste. If not, all PPE should be disposed as non-hazardous waste in the designated on-site landfill. Trash that is generated as part of field activities may be disposed of in the landfill as long as the trash was not exposed to hazardous media.

### 6.4 Waste Accumulation On-Site

6.4.1 Solid, liquid, or PPE waste generated during investigation activities that are classified as nonhazardous or "characterization pending analysis" should be disposed of as soon as possible. Until disposal, such containers should be inventoried, stored as securely as possible, and inspected regularly, as a general good practice.

6.4.2 Solid, liquid, or PPE waste generated during investigation activities that are classified as hazardous shall not be accumulated on-site longer than 90 days. All hazardous waste containers shall be stored in a secured storage area. The following requirements for the hazardous waste storage area must be implemented:

- Proper hazardous waste signs shall be posted as required by any state or federal statutes that may govern the labelling of waste;
- Secondary containment to contain spills;
- Spill containment equipment must be available;
- Fire extinguisher;
- Adequate aisle space for unobstructed movement of personnel.

- 6.4.3 Weekly storage area inspections shall be performed and documented to ensure compliance with these requirements. Throughout the project, an inventory shall be maintained to itemize the type and quantity of the waste generated.

## 6.5 Waste Disposal

- 6.5.1 Solid, liquid, and PPE waste will be characterized for disposal through the use of client knowledge, laboratory analytical data created from soil or groundwater samples gathered during the field activities, and/or composite samples from individual containers.
- 6.5.2 All waste generated during field activities will be stored, transported, and disposed of according to applicable state, federal, and local regulations. All wastes classified as hazardous will be disposed of at a licensed treatment storage and disposal facility or managed in other approved manners.
- 6.5.3 In general, waste disposal should be carefully coordinated with the facility receiving the waste. Facilities receiving waste have specific requirements that vary even for non-hazardous waste, so characterization should be conducted to support both applicable regulations and facility requirements.

## 6.6 Regulatory Requirements

The following federal and state regulations shall be used as resources for determining waste characteristics and requirements for waste storage, transportation, and disposal:

- Code of Federal Regulations (CFR), Title 40, Part 261;
- CFR, Title 49, Parts 172, 173, 178, and 179.

## 6.7 Waste Transport

A state-certified hazardous waste hauler shall transport all wastes classified as hazardous. Typically, the facility receiving any waste can coordinate a hauler to transport the waste. Shipped hazardous waste shall be disposed of in accordance with all RCRA/USEPA requirements. All waste manifests or bills of lading will be signed either by the client or the client's designee.

# 7.0 Quality Control and Assurance

- 7.1 Management of IDW must incorporate quality control measures to ensure conformance to these and the project requirements.

# 8.0 Records, Data Analysis, Calculations

- 8.1 Maintain records as required by implanting the procedures in this SOP.
- 8.2 Deviations from this procedure or the sampling and analysis plan shall be documented in field records. Significant changes shall be approved by the **Program Quality Manager**.

# 9.0 Attachments or References

Department of Defense, United States (DoD). 2005. [\*Uniform Federal Policy for Quality Assurance Project Plans, Part 1: UFP-QAPP Manual\*](#). Final Version 1. DoD: DTIC ADA 427785, EPA-505-B-04-900A. In conjunction with the U. S. Environmental Protection Agency and the Department of Energy. Washington: Intergovernmental Data Quality Task Force. March. On-line updates available at: [http://www.epa.gov/-fedfac/pdf/ufp\\_qapp\\_v1\\_0305.pdf](http://www.epa.gov/-fedfac/pdf/ufp_qapp_v1_0305.pdf).

Department of Energy, United States (DOE). 1994. [\*The Off-Site Rule\*](#). EH-231-020/0194. Office of Environmental Guidance. March.

1999. *Management of Remediation Waste under the Resource Conservation and Recovery Act (RCRA)*. Office of Environmental Policy and Assistance. 20 December.
- Environmental Protection Agency, United States (EPA). 1991. *Management of Investigative-Derived Wastes During Site Inspections*. Office of Emergency and Remedial Response. EPA/540/G-91/009. May.
- 1992a. *Guidance for Performing Site Inspections under CERCLA*. [EPA/540/R-92/021](#). Office of Emergency and Remedial Response. September.
- 1992b. *Guide to Management of Investigative-Derived Wastes*. Quick reference fact sheet. OSWER Dir. 9345.3-03FS. Office of Solid Waste and Emergency Response. January.
- 1997a. *Sending Wastes Off Site? OSC and RPM Responsibilities under the Off-Site Rule*. EPA/540-F-97-006, Office of Solid Waste and Emergency Response. September.
- 1997b. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846*. 3rd ed., Final Update IIIA. Office of Solid Waste. Updates available: [www.epa.gov/epaoswer/hazwaste/test/new-meth.htm](http://www.epa.gov/epaoswer/hazwaste/test/new-meth.htm).
1998. *Management of Remediation Waste under RCRA*. EPA/530-F-98-026. Office of Solid Waste and Emergency Response. October.
- (No Date). *Compliance with the Off-Site Rule During Removal Actions*. Office of Regional Counsel (Region 3). Hendershot, Michael.

Author	Reviewer	Revisions (Technical or Editorial)
Mark Kromis Program Chemist	Chris Barr Program Quality Manager	Rev 0 – Initial Issue (May 2012)

# Equipment Decontamination

## Procedure 3-06

### 1.0 Purpose and Scope

- 1.1 This standard operating procedure (SOP) describes methods of equipment decontamination, to be used for activities where samples for chemical analysis are collected or where equipment will need to be cleaned before leaving the site or before use in subsequent activities.
- 1.2 As guidance for specific activities, this procedure does not obviate the need for professional judgment. Deviations from this procedure while planning or executing planned activities must be approved in accordance with Program requirements for technical planning and review.

### 2.0 Safety

It is the responsibility of the **Site Safety and Health Officer (SSHO)** to set up the site zones (i.e., exclusion, transition, and clean) and decontamination areas. Generally the decontamination area is located within the transition zone, upwind of intrusive activities, and serves as the washing area for both personnel and equipment to minimize the spread of contamination into the clean zone. Typically, for equipment, a series of buckets are set up on a visqueen-lined bermed area. Separate spray bottles containing cleaning solvents as described in this procedure or the Work Plan (WP) and distilled water are used for final rinsing of equipment. Depending on the nature of the hazards and the site location, decontamination of heavy equipment, such as augers, pump drop pipe, and vehicles, may be accomplished using a variety of techniques.

All **Field Personnel** responsible for equipment decontamination must adhere to the site-specific accident prevention plan (APP) and Site Safety and Health Plan (SSHP) and must wear the personal protective equipment (PPE) specified in the site-specific APP/SSHP. Generally this includes, at a minimum, Tyvek® coveralls, steel-toed boots with boot covers or steel-toed rubber boots, safety glasses, American National Standards Institute-standard hard hats, and hearing protection (if heavy equipment is in operation). Air monitoring by the **SSHO** may result in an upgrade to the use of respirators and cartridges in the decontamination area; therefore, this equipment must be available on site. If safe alternatives are not achievable, discontinue site activities immediately.

In addition to the aforementioned precautions, the following sections describe safe work practices that will be employed.

#### 2.1 Chemical Hazards associated with Equipment Decontamination

- Avoid skin contact with and/or incidental ingestion of decontamination solutions and water.
- Utilize PPE as specified in the site-specific HSP to maximize splash protection.
- Refer to material safety data sheets, safety personnel, and/or consult sampling personnel regarding appropriate safety measures (i.e., handling, PPE including skin and respiratory).
- Take the necessary precautions when handling detergents and reagents.

#### 2.2 Physical Hazards associated with Equipment Decontamination

- To avoid possible back strain, it is recommended to raise the decontamination area 1 to 2 feet above ground level.



- To avoid heat stress, over exertion, and exhaustion, it is recommended to rotate equipment decontamination among all site personnel.
- Take necessary precautions when handling field sampling equipment.

### 3.0 Terms and Definitions

None.

### 4.0 Training and Qualifications

- 4.1 The **Project Manager** is responsible for ensuring that decontamination activities comply with this procedure. The **Project Manager** is responsible for ensuring that all personnel involved in equipment decontamination shall have the appropriate education, experience, and training to perform their assigned tasks.
- 4.2 The **Program Quality Manager** is responsible for ensuring overall compliance with this procedure.
- 4.3 The **Site Supervisor (SS)** is responsible for ensuring that all field equipment is decontaminated according to this procedure.
- 4.4 All **Field Personnel** are responsible for the implementation of this procedure.

### 5.0 Procedure

Decontamination of equipment used in soil/sediment sampling, groundwater monitoring, well drilling and well development, as well as equipment used to sample groundwater, surface water, sediment, waste, wipe, asbestos, and unsaturated zone, is necessary to prevent cross-contamination and to maintain the highest integrity possible in collected samples. Planning a decontamination program requires consideration of the following factors:

- Location where the decontamination procedures will be conducted
- Types of equipment requiring decontamination
- Frequency of equipment decontamination
- Cleaning technique and types of cleaning solutions appropriate to the contaminants of concern
- Method for containing the residual contaminants and wash water from the decontamination process
- Use of a quality control measure to determine the effectiveness of the decontamination procedure

The following subsections describe standards for decontamination, including the frequency of decontamination, cleaning solutions and techniques, containment of residual contaminants and cleaning solutions, and effectiveness.

#### 5.1 Decontamination Area

Select an appropriate location for the decontamination area at a site based on the ability to control access to the area, the ability to control residual material removed from equipment, the need to store clean equipment, and the ability to restrict access to the area being investigated. Locate the decontamination area an adequate distance away and upwind from potential contaminant sources to avoid contamination of clean equipment.

#### 5.2 Types of Equipment

Drilling equipment that must be decontaminated includes drill bits, auger sections, drill-string tools, drill rods, split barrel samplers, tremie pipes, clamps, hand tools, and steel cable. Decontamination of monitoring well development and groundwater sampling equipment includes submersible pumps, bailers, interface probes, water level meters, bladder pumps, airlift pumps, peristaltic pumps, and lysimeters.

Other sampling equipment that requires decontamination includes, but is not limited to, hand trowels, hand augers, slide hammer samplers, shovels, stainless-steel spoons and bowls, soil sample liners and caps, wipe sampling templates, composite liquid waste samplers, and dippers. Equipment with a porous surface, such as rope, cloth hoses, and wooden blocks, cannot be thoroughly decontaminated and shall be properly disposed of after one use.

### 5.3 **Frequency of Equipment Decontamination**

Decontaminate down-hole drilling equipment and equipment used in monitoring well development and purging prior to initial use and between each borehole or well. Down-hole drilling equipment, however, may require more frequent cleaning to prevent cross-contamination between vertical zones within a single borehole. When drilling through a shallow contaminated zone and installing a surface casing to seal off the contaminated zone, decontaminate the drilling tools prior to drilling deeper. Initiate groundwater sampling by sampling groundwater from the monitoring well where the least contamination is suspected. Decontaminate groundwater, surface water, and soil sampling devices prior to initial use and between collection of each sample to prevent the possible introduction of contaminants into successive samples.

### 5.4 **Cleaning Solutions and Techniques**

Decontamination can be accomplished using a variety of techniques and fluids. The preferred method of decontaminating major equipment, such as drill bits, augers, drill string, and pump drop-pipe, is steam cleaning. To steam clean, use a portable, high-pressure steam cleaner equipped with a pressure hose and fittings. For this method, thoroughly steam wash equipment and rinse it with potable tap water to remove particulates and contaminants.

A rinse decontamination procedure is acceptable for equipment such as bailers, water level meters, new and re-used soil sample liners, and hand tools. The decontamination procedure shall consist of the following: (1) wash with a non-phosphate detergent (Alconox®, Liquinox®, or other suitable detergent) and potable water solution; (2) rinse with potable water; (3) spray with laboratory-grade isopropyl alcohol; (4) rinse with deionized or distilled water; and (5) spray with deionized or distilled water. If possible, disassemble equipment prior to cleaning. Add a second wash at the beginning of the process if equipment is very soiled.

Decontaminating submersible pumps requires additional effort because internal surfaces become contaminated during usage. Decontaminate these pumps by washing and rinsing the outside surfaces using the procedure described for small equipment or by steam cleaning. Decontaminate the internal surfaces by recirculating fluids through the pump while it is operating. This recirculation may be done using a relatively long (typically 4 feet) large-diameter pipe (4-inch or greater) equipped with a bottom cap. Fill the pipe with the decontamination fluids, place the pump within the capped pipe, and operate the pump while recirculating the fluids back into the pipe. The decontamination sequence shall include: (1) detergent and potable water; (2) potable water rinse; (3) potable water rinse; and (4) deionized water rinse. Change the decontamination fluids after each decontamination cycle.

Solvents other than isopropyl alcohol may be used, depending upon the contaminants involved. For example, if polychlorinated biphenyls or chlorinated pesticides are contaminants of concern, hexane may be used as the decontamination solvent; however, if samples are also to be analyzed for volatile organics, hexane shall not be used. In addition, some decontamination solvents have health effects that must be considered. Decontamination water shall consist of distilled or deionized water. Steam-distilled water shall not be used in the decontamination process as this type of water usually contains elevated concentrations of metals. Decontamination solvents to be used during field activities will be specified in the CTO WP.

Rinse equipment used for measuring field parameters, such as pH (indicates the hydrogen ion concentration – acidity or basicity), temperature, specific conductivity, and turbidity with deionized or distilled water after each measurement. Also wash new, unused soil sample liners and caps with a fresh

detergent solution and rinse them with potable water followed by distilled or deionized water to remove any dirt or cutting oils that might be on them prior to use.

## 5.5 **Containment of Residual Contaminants and Cleaning Solutions**

A decontamination program for equipment exposed to potentially hazardous materials requires a provision for catchment and disposal of the contaminated material, cleaning solution, and wash water.

When contaminated material and cleaning fluids must be contained from heavy equipment, such as drill rigs and support vehicles, the area must be properly floored, preferably with a concrete pad that slopes toward a sump pit. If a concrete pad is impractical, planking can be used to construct solid flooring that is then covered by a nonporous surface and sloped toward a collection sump. If the decontamination area lacks a collection sump, use plastic sheeting and blocks or other objects to create a bermed area for collection of equipment decontamination water. Situate items, such as auger flights, which can be placed on metal stands or other similar equipment, on this equipment during decontamination to prevent contact with fluids generated by previous equipment decontamination. Store clean equipment in a separate location to prevent recontamination. Collect decontamination fluids contained within the bermed area and store them in secured containers as described below.

Use wash buckets or tubs to catch fluids from the decontamination of lighter-weight drilling equipment and hand-held sampling devices. Collect the decontamination fluids and store them on site in secured containers, such as U.S. Department of Transportation-approved drums, until their disposition is determined by laboratory analytical results. Label containers in accordance with Procedure 3-05, *IDW Management*.

## 6.0 **Quality Control and Assurance**

A decontamination program must incorporate quality control measures to determine the effectiveness of cleaning methods. Quality control measures typically include collection of equipment blank samples or wipe testing. Equipment blanks consist of analyte-free water that has been poured over or through the sample collection equipment after its final decontamination rinse. Wipe testing is performed by wiping a cloth over the surface of the equipment after cleaning. These quality control measures provide "after-the-fact" information that may be useful in determining whether or not cleaning methods were effective in removing the contaminants of concern.

## 7.0 **Records, Data Analysis, Calculations**

Any project where sampling and analysis is performed shall be executed in accordance with an approved sampling and analysis plan. This procedure may be incorporated by reference or may be incorporated with modifications described in the plan.

Deviations from this procedure or the sampling and analysis plan shall be documented in field records. Significant changes shall be approved by the **Program Quality Manager**.

## 8.0 **Attachments or References**

- 8.1 ASTM Standard D5088. 2008. *Standard Practice for Decontamination of Field Equipment Used at Waste Sites*. ASTM International, West Conshohocken, PA. 2008. DOI: 10.1520/D5088-02R08. [www.astm.org](http://www.astm.org).
- 8.2 NAVSEA T0300-AZ-PRO-010. *Navy Environmental Compliance Sampling and Field Testing Procedures Manual*. August 2009.
- 8.3 Procedure 3-05, *IDW Management*.

<i>Author</i>	<i>Reviewer</i>	<i>Revisions (Technical or Editorial)</i>
Mark Kromis Program Chemist	Chris Barr Program Quality Manager	Rev 0 – Initial Issue

# Surface Water and Liquid Sampling

## Procedure 3-10

### 1.0 Purpose and Scope

- 1.1 The purpose of this document is to define the standard operating procedure (SOP) for surface water and liquid sampling (for example, liquid characterization sampling). This SOP describes the equipment, field procedures, materials, and documentation procedures necessary to surface water samples from shallow and deep water using a variety of samplers. Specific information regarding coring locations can be found in the associated Sampling and Analysis Plan (SAP).
- 1.2 This procedure is the Program-approved professional guidance for work performed by AECOM under contract to the United States Army Corp of Engineers (USACE).
- 1.3 As guidance for specific activities, this procedure does not obviate the need for professional judgment. Deviations from this procedure while planning or executing planned activities must be approved in accordance with Program requirements for technical planning and review. If there are procedures whether it be from Resolution Consultants, state and/or federal that are not addressed in this SOP and are applicable to surface water sampling then those procedures may be added as an appendix to the project specific SAP.
- 1.4 It is fully expected that the procedures outlined in this SOP will be followed. Procedural modifications may be warranted depending upon field conditions, equipment limitations, or limitations imposed by the procedure. Substantive modification to this SOP will be approved in advance by the Program Quality Manager. Deviations to this SOP will be documented in the field records.

### 2.0 Safety

- 2.1 Depending upon the site-specific contaminants, various protective programs must be implemented prior to sampling the first surface water sampling location. All **field sampling personnel** responsible for sampling activities must review the project-specific Accident Prevention Plan (APP) and Site Safety and Health Plan (SSHP) paying particular attention to the control measures planned for the sampling tasks. Conduct preliminary area monitoring to determine the potential hazard to field sampling personnel. If significant contamination is observed, minimize contact with potential contaminants in both the vapor and liquid phase through the use of respirators and disposable clothing.
- 2.2 In addition, observe standard health and safety practices according to the project-specific APP/ SSHP. Suggested minimum protection during well sampling activities includes inner disposable vinyl gloves, outer chemical-protective nitrile gloves, rubberized steel-toed boots, and an American National Standards Institute-standard hard hat. Half-face respirators and cartridges and Tyvek® suits may be necessary depending on the contaminant concentrations, and shall always be available on site.
- 2.3 Daily safety briefs will be conducted at the start of each working day before any work commences. These daily briefs will be facilitated by the **Site Safety and Health Officer (SSHO)** or designee to discuss the day's events and any potential health risk areas covering every aspect of the work to be completed. Weather conditions are often part of these discussions. As detailed in the APP, everyone on the field team has the authority to stop work if an unsafe condition is perceived until the conditions are fully remedied to the satisfaction of the SSHO.

- 2.4 The health and safety considerations for the work associated with surface water sampling include:
- Proper selection of personal protective equipment for work around water bodies (e.g., personal flotation devices [PFDs]), as specified in the project-specific APP.
  - Appropriate health and safety protocols for working in a boat (if applicable), as specified in the project-specific APP.
  - Proper lifting techniques when retrieving surface water samplers, large muscles of the legs should be used, not the back.
  - Stay clear of all moving equipment and avoid wearing loose fitting clothing.
  - To avoid slip/trip/fall hazards as a result of working on wet surfaces, wear work boots/work boot covers with textured soles.
  - To avoid heat/cold stress as a result of exposure to extreme temperatures and PPE, drink electrolyte replacement fluids (1 to 2 cups per hour is recommended), and in cases of extreme cold, wear fitted insulated clothing

### 3.0 Terms and Definitions

None.

### 4.0 Interferences

None.

### 5.0 Training and Qualifications

#### 5.1 Qualifications and Training

- 5.1.1 The individual executing these procedures must have read, and be familiar with, the requirements of this SOP.

#### 5.2 Responsibilities

- 5.2.1 The **Project Manager** is responsible for ensuring that surface water sampling activities comply with this procedure. The Project Manager or designee shall review all surface water sampling forms on a minimum monthly basis. The Project Manager is responsible for ensuring that all field sampling personnel involved in surface water sampling shall have the appropriate education, experience, and training to perform their assigned tasks.
- 5.2.2 The **Program Quality Manager** is responsible for ensuring overall compliance with this procedure.
- 5.2.3 The **Site Supervisor (SS)** is responsible for ensuring that all field sampling personnel follow these procedures.
- 5.2.4 **Field sampling personnel** are responsible for the implementation of this procedure. Minimum qualifications for field sampling personnel require that one individual on the field team shall have a minimum of 6 months of experience with surface water sampling.
- 5.2.5 The **field sampler and/or task manager** is responsible for directly supervising the surface water sampling procedures to ensure that they are conducted according to this procedure, and for recording all pertinent data collected during sampling. If deviations from the procedure are required because of anomalous field conditions, they must first be approved by the Program Quality Manager and then documented in the field logbook and associated report or equivalent document.

## 6.0 Equipment and Supplies

The following equipment list contains materials that may be needed in carrying out the procedures outlined in this SOP. Not all equipment listed below may be necessary for a specific activity. Additional equipment may be required, pending field conditions.

- Work Plan
- Maps/Plot plan
- Tape measure
- Survey stakes, flags, or buoys
- Camera and film
- Stainless steel, plastic, or other appropriate composition (e.g., Teflon) bucket
- Laboratory supplied sampling containers
- Ziploc plastic bags for samples, and sample jars
- Logbook
- Labels
- Chain of Custody (COC) forms
- Site description forms
- Cooler(s)
- Ice
- Equipment/Apparatus
- Decontamination supplies/equipment
- Spade or shovel
- Spatula
- Scoop
- Trowel
- Task specific surface water sampling equipment

## 7.0 Calibration or Standardization

None.

## 8.0 Procedure

### 8.1 Selection of Sampling Techniques

Proper selection of sampling points and collection methodology are essential to meeting the objectives of a surface water sampling program. Sampling points should be selected for collection of surface water samples on the basis of characteristics of the body of surface water body to be monitored, the location of the body of surface water, and its hydrologic boundaries with respect to the site. Other considerations include the contaminants of concern, logistical considerations, such as access to the surface water body, the direction of flow, and determination of a background location.

Methods of collecting surface water samples vary from hand sampling procedures at a single point to sophisticated, multipoint sampling techniques. The number and type of samples to be collected depends on the characteristics of the body of water, the amount of suspended sediment that a moving body carries, the size of the discharge area at the site, and other factors. Multipoint sampling techniques apply to larger bodies of water; the samples are composited to provide a more representative sample.

Whenever possible, the sampling device, either disposable or constructed of a nonreactive material, should hold at least 500 milliliters to minimize the number of times the liquid must be disturbed, thus reducing agitation of any sediment layers. A 1-liter polypropylene or stainless steel beaker with a pour spout and handle works well. Any sampling device might contribute contaminants to a sample. The correct sampling device will not compromise the integrity of the sample and will give the desired analytical results.

#### 8.1.1 **Shallow Water Body Surface Water Sample Collection**

A dip or grab sample is appropriate for a small body of water, or for collecting near-surface samples in a larger surface water body. The sampling method involves filling a sample container by submerging it either just below the surface, or by lowering the container to a desired depth by using a weighted holder. For shallow bodies of surface water, hold the sample container carefully just beneath the water surface to avoid disturbing the streambed and stirring the sediment. Position the container's mouth so that it faces upstream, while the sampling personnel are standing downstream. Any preservative added to the sample should be added after sample collection to avoid loss of preservative. Alternatively, a transfer device may be dipped into the water, and then the contents transferred to the appropriate container containing the preservative. For near-surface sample collection in a large surface water body, a pond sampler may be used if an extended reach is required to collect a representative sample. A pond sampler consists of a single use sample container attached to a telescoping, heavy-duty, aluminium pole via an adjustable clamp attached to the end. The collection technique for shallow surface water samples can be used for near-surface samples in a large surface water body.

#### 8.1.2 **Deep Surface Water Sample Collection**

For deeper surface water bodies, either sample containers or transfer devices may be used to collect a sample. A weighted holder that allows either a sample transfer device or a sample container to be lowered, opened for filling, closed, and returned to the surface is suggested for sampling deeper surface water bodies. This is because concentrations of constituents near the surface of a deeper body of surface water might differ from the total concentration distributed throughout the water column cross section and thus a surface sample would not be representative of the water body. An open container that is lowered and raised to the surface at a uniform rate so that the bottle is just filled on reaching the surface is appropriate for deeper stagnant water bodies, however this method does not collect a truly representative sample in deeper flowing surface water bodies.

**Kemmerer Samplers.** Collect samples near the shore unless sampling from a boat is feasible and permitted. If a boat is used, the body of water should be cross-sectioned and samples should be collected at various depths across the water in accordance with the project specific SAP. The Kemmerer Sampler consists of a glass, plastic, or Teflon bottle, a weighted sinker, a bottle stopper, and a line that is used to open the bottle and to lower and raise the sampler during sampling. The general procedure for using the sampler is as follows (or refer to manufacturer's instructions):

1. Obtain the sampler and check the knot at the bottom of the sampler for tightness and size. The knot should be sufficiently large so that it will not pull through the central tube of the sampler.
2. Assemble the weighted bottle sampler for making the cast by pulling the trip head into the trip plate. This can be done by holding the top and bottom stoppers and giving a short, hard pull to the bottom stopper.
3. Measure and mark the desired depth on the sampling line. Tie the free end of the line to the railing of the vessel to prevent accidental dropping of the sampler.



4. Gently lower the sampler to the desired depth so as not to remove the stopper prematurely.
5. Pull out the stopper with a sharp jerk of the sampler line or by lowering a messenger down the line to trip the stoppers.
6. Allow the bottle to fill completely, as evidenced by the cessation of air bubbles.
7. Raise the sampler and cap the bottle. Untie the line from the railing and carry the sampler to your sampling station.
8. Transfer water into appropriate sample containers. Preserve the sample, if necessary, following guidelines in the project-specific SAP. In most cases, place preservatives in sample containers before sample collection to avoid overexposure of samples and overfilling of bottles during collection.
9. Check that a Teflon liner is present in the cap, if required. Secure the cap tightly.
10. Fill out the sample label and record all relevant information in the sample collection form, the field logbook, and/or the field laptop/tablet. In addition, the chain of custody form should be filled out as soon as possible. These procedures should be done in accordance with SOP 3-03 Recordkeeping, Sample Labeling, and Chain of Custody.
11. Immediately place the properly labeled sample bottle(s) in a cooler with ice.
12. Wipe the sample clean and decontaminate if necessary for the collection of additional samples. Decontaminate according to the procedures in SOP 3-06 Equipment Decontamination.
13. Always store the sampler in the open position (stoppers not in the tube).

**Teflon Bailers.** Teflon bailers can also be used to collect samples in deep bodies of water. When the use of Teflon bailers is deemed appropriate for sampling water from a specific depth, the bailers shall be equipped with a check valve that closes during sample retrieval.

1. Attach a line that is premeasured to the appropriate sampling depth to the dedicated Teflon bailer and lower to the desired depth.
2. Ensure that the check valve is engaged tugging on the line with a sharp jerk.
3. Raise the bailer and transfer the water to sample containers. Preserve the sample, if necessary, following guidelines in the project-specific SAP. In most cases, place preservatives in sample containers before sample collection to avoid overexposure of samples and overfilling of bottles during collection.
4. Check that a Teflon liner is present in the cap, if required. Secure the cap tightly.
5. Fill out the sample label and record all relevant information in the sample collection form, the field logbook, and/or the field laptop/tablet. In addition, the chain of custody form should be filled out as soon as possible. These procedures should be done in accordance with SOP 3-03 Recordkeeping, Sample Labeling, and Chain of Custody.
6. Immediately place the properly labeled sample bottle(s) in a cooler with ice.
7. A new dedicated bailer and new line should be used for each sampling location.

**Peristaltic Pump.** Another method of extending the reach of sampling efforts is to use a small peristaltic pump. In this method, the sample is drawn through heavy-wall Teflon tubing and pumped directly into the sample container. This system allows the operator to reach into the liquid body, sample from depth, or sweep the width of narrow streams.

If medical-grade silicon tubing is used in the peristaltic pump, the system is suitable for sampling almost any analyte, including most organics. Some volatile stripping may occur; due to the relatively high flow rate of the pump. Therefore, avoid pumping methods for sampling volatile organics. Battery-operated peristaltic pumps are available and can be easily carried by hand or with a shoulder sling, as needed. It is necessary in most situations to change both the Teflon suction line and the silicon pump tubing between sampling locations to avoid cross contamination. This action requires maintaining a sufficiently large stock of material to avoid having to clean the tubing in the field.

Peristaltic pumps work especially well for sampling large bodies of water when a near-surface sample will not sufficiently characterize the body as a whole. When sampling a liquid stream that exhibits a considerable flow rate, it may be necessary to weight the bottom of the suction line.

Use the following procedures for collecting samples using peristaltic pumps:

1. Install clean, silicone tubing in the pump head, per the manufacturer's instructions. Pharmaceutical-grade silicone tubing (e.g., PharMed tubing) may be required for some projects depending on the analyses required. Refer to the project specific SAP for specific tubing requirements. Allow sufficient tubing on the discharge side to facilitate convenient dispensation of liquid into sample bottles but only enough on the suction end for attachment to the intake line. This practice will minimize sample contact with the silicone pump tubing. (Some types of thinner Teflon tubing may be used.)
2. Select the length of suction intake tubing necessary to reach the required sample depth and attach it to the tubing on the intake side of the pump. If necessary, a small weight composed of inert material (e.g., stainless steel) which will not react with chemicals of concern may be used to weight the intake tubing. Heavy-wall Teflon of a diameter equal to the required pump tubing will suit most applications. (A heavier wall will allow for a slightly greater lateral reach.)
3. A purge volume that is at a minimum equal to the tubing volume should be passed through the system prior to sample collection. Collect this purge volume in a bucket. Once the sample has been collected, the purged water volume can be returned to the water body.
4. Fill necessary sample bottles by allowing pump discharge to flow gently down the side of bottle with smooth laminar flow and minimal entry turbulence. Cap each bottle as it is filled.
5. Preserve the sample, if necessary, following guidelines in the project-specific SAP. In most cases, place preservatives in sample containers before sample collection to avoid overexposure of samples and overfilling of bottles during collection.
6. Check that a Teflon liner is present in the cap, if required. Secure the cap tightly.
7. Fill out the sample label and record all relevant information in the sample collection form, the field logbook, and/or the field laptop/tablet. In addition, the chain of custody form should be filled out as soon as possible. These procedures should be done in accordance with SOP 3-03 Recordkeeping, Sample Labeling, and Chain of Custody.
8. Immediately place the properly labeled sample bottle in a cooler with ice.
9. Allow the system to drain thoroughly, and then disassemble.

## 8.2 Transfer Devices

Samples from various locations and depths can be composited if project quality objectives indicate that it is appropriate; otherwise, collect separate samples. Identify approximate sampling points on a sketch of the water body. Use the following procedures for collecting samples using transfer devices:

1. Submerge a stainless steel dipper or other suitable device, causing minimal disturbance to the surface of the water and the sediment at the floor of the surface water body. Note the approximate depth and location of the sample source (e.g., 1 foot up from bottom or just below the surface).
2. Allow the device to fill slowly and continuously.
3. Retrieve the dipper or device from the surface water with minimal disturbance.
4. Remove the cap from the sample bottle and slightly tilt the mouth of the bottle below the dipper or device edge.
5. Empty the dipper or device slowly, allowing the sample stream to flow gently down the side of the bottle with smooth laminar flow and minimal entry turbulence.
6. Continue delivery of the sample until the bottle is filled.
7. If necessary, preserve the sample according to guidelines in the project-specific SAP. In most cases, place preservatives in sample containers before sample collection to avoid overexposure of samples and overfilling of bottles during collection.

8. Check that a Teflon liner is present in the cap, if required. Secure the cap tightly.
9. Fill out the sample label and record all relevant information in the sample collection form, the field logbook, and/or the field laptop/tablet. In addition, the chain of custody form should be filled out as soon as possible. These procedures should be done in accordance with SOP 3-03 Recordkeeping, Sample Labeling, and Chain of Custody.
10. Dismantle the sampler and decontaminate according to the procedures in SOP 3-06 Equipment Decontamination.

Multipoint sampling techniques that represent both dissolved and suspended constituents and both vertical and horizontal distributions are applicable to larger bodies of water. Subsequent to sample collection, multipoint sampling techniques may require a compositing and sub-sampling process to homogenize all the individual samples into the number of subsamples required to perform the analyses of interest. Homogenizing samples is discouraged for samples collected for volatile organic analysis, because aeration causes a loss of volatile compounds. If collection of composite samples is required, then include the procedure for compositing in the project-specific work plan.

The sampling devices selected must not compromise sample integrity. Collect samples with either disposable devices, or devices constructed of a nonreactive material, such as glass, stainless steel, or Teflon. The device must have adequate capacity to minimize the number of times the liquid must be disturbed, reducing agitation of any sediment layers. Further, the device must be able to transfer the water sample into the sample container without loss of volatile compounds. A single- or double-check valve or stainless steel bailer made of Teflon equipped with a bottom discharging device may be utilized.

All equipment used for sample collection must be decontaminated before and after use in accordance with Procedure 3-06 – Equipment Decontamination.

## 9.0 Quality Control and Assurance

- 9.1 Field personnel will follow specific quality assurance (QA) guidelines as outlined in the project-specific SAP. The goal of the QA program should be to ensure precision, accuracy, representativeness, completeness, and comparability in the project sampling program.
- 9.2 Quality Control (QC) requirements for sample collection are dependent on project-specific sampling objectives. The project-specific SAP will provide requirements for sample preservation, holding times, container types, as well as various QC samples such as trip blanks, field blanks, equipment blanks, and field duplicates.

## 10.0 Data and Records Management

- 10.1 Field notes will be kept during sampling activities in accordance with SOP 3-03 – Recordkeeping, Sample Labeling, and Chain of Custody. During the completion of sampling activities, fill out the sample logbook and transmit forms to the CTO Manager for storage in project files.
- 10.2 Deviations to the procedures detailed in the SOP should be recorded in the field logbook.

## 11.0 Attachments or References

Department of Defense, United States (DoD). 2005. *Uniform Federal Policy for Quality Assurance Project Plans, Part 1: UFP-QAPP Manual*. Final Version 1. DoD: DTIC ADA 427785, EPA-505-B-04-900A. In conjunction with the U. S. Environmental Protection Agency and the Department of Energy. Washington: Intergovernmental Data Quality Task Force. March. On-line updates available at: [http://www.epa.gov/fedfac/pdf/ufp\\_qapp\\_v1\\_0305.pdf](http://www.epa.gov/fedfac/pdf/ufp_qapp_v1_0305.pdf).

Environmental Protection Agency, United States (EPA). 1987. *A Compendium of Superfund Field Operations Methods*. EPA/540/P-87/001, EPA, Office of Emergency and Remedial Response, Washington, D.C.

<i>Author</i>	<i>Reviewer</i>	<i>Revisions (Technical or Editorial)</i>
Robert Shoemaker Senior Scientist	Naomi Ouellette, Project Manager	Rev 0 – Initial Issue

# Monitoring Well Development

## Procedure 3-13

### 1.0 Purpose and Scope

- 1.1 This standard operating procedure (SOP) describes the procedures used for developing newly installed monitoring wells and/or redeveloping existing wells.
- 1.2 The purpose of well development is to remove interferences from a well to provide better connection between the well and the formation, to improve pumping performance of the well, and to be able to collect more representative information from the well (e.g., samples, test results, etc.). Proper well development will:
- Remove drilling residuals (e.g., water, mud) from the borehole and surrounding formations;
  - Improve or restore hydraulic conductivity of the surrounding formations which may have been disturbed during the drilling process;
  - Remove residual fines from the well screen and sand pack (filter pack) materials, thus reducing turbidity of groundwater and permitting the collection of more representative groundwater samples.
- 1.3 There may be circumstances where well development is not desirable, for example, in the presence of non-aqueous phase liquids (NAPL) or other significant contamination if development could worsen the contaminant impact. If NAPL begins to intrude during development, the development process will be halted. This situation will be considered a cause for sample modification requiring approval by the Project Manager and other stakeholders, as applicable.
- 1.4 The applicable well development procedures for a particular site may be subject to State or local regulatory requirements. In all cases, the project team should consult their local regulatory requirements and document the selected well development procedure in the project-specific Sampling and Analysis Plan (SAP). For project-specific information refer to the Work Plan (WP) and Sampling and Analysis Plan (SAP), which takes precedence over these procedures.
- 1.5 This procedure is the professional guidance for work performed by AECOM under contract to the United States Army Corp of Engineers (USACE).
- 1.6 As guidance for specific activities, this procedure does not obviate the need for professional judgment. Deviations from this procedure while planning or executing planned activities must be approved in accordance with Program requirements for technical planning and review.

### 2.0 Safety

- 2.1 The health and safety considerations for the work associated with this SOP, including both potential physical and chemical hazards, will be addressed in the project-specific Accident Prevention Plan (APP) and Site Safety and Health Plan (SSHP). In the absence of a APP/SSHP, work will be conducted according to the project-specific WP, SAP, and/or direction from the Site Safety and Health Officer (SSHO).
- 2.2 Monitoring well development may involve chemical hazards associated with potential contaminants in the soil or aquifer being characterized and may involve physical hazards associated with use of well development equipment.

### 3.0 Terms and Definitions

None.

## 4.0 Interferences

- 4.1 Equipment/materials used for development may react with the groundwater during development. Appropriate development equipment has been selected for the anticipated condition of the groundwater.
- 4.2 Appropriate development methods such as using a surge-block to flush suspended fines in the groundwater in and out of the well screen can improve the yield of wells and improve their potential to be developed successfully. However, the effectiveness of development can be significantly reduced in wells that do not yield sufficient water to allow this flushing to take place.
- 4.3 For formations with a significant content of fine-grained materials (silts and clays), or wells with improperly sized screens, it may not be possible to reduce turbidity to commonly acceptable levels. Possible solutions may include collecting a sample even if excessively turbid, or installing a replacement well.
- 4.4 Development itself disturbs the surrounding formation and disrupts equilibrium conditions within the well. Groundwater samples will not be collected until a minimum of 24 hours after a well is developed to allow conditions to stabilize. For sites with fine-grained formations (silts and clays) and highly sorptive contamination, a longer time period between development and sampling should be considered.

## 5.0 Training and Qualifications

- 5.1 Qualifications and Training
 

The individual executing these procedures must have read, and be familiar with, the requirements of this SOP.
- 5.2 Responsibilities
  - 5.2.1 The **Project Manager** is responsible for ensuring that well development activities comply with this procedure. The **Project Manager** is responsible for ensuring that all personnel involved in well development shall have the appropriate education, experience, and training to perform their assigned tasks.
  - 5.2.2 The **Program Quality Manager** is responsible for ensuring overall compliance with this procedure.
  - 5.2.3 The **Site Supervisor** is responsible for ensuring that all well development activities are conducted according to the either this procedure or the applicable procedure presented in the project-specific SAP.
  - 5.2.4 **Field sampling personnel** are responsible for the implementation of this procedure.
  - 5.2.5 The field sampler and/or task manager is responsible for directly supervising the well development procedures to ensure that they are conducted according to this procedure and for recording all pertinent data collected during sampling.

## 6.0 Equipment and Supplies

- 6.1 This equipment list was developed to aid in field organization and should be used in planning and preparation. Depending on the site-specific requirements and the development method selected, additional or alternative material and equipment may be necessary. In addition, for sites where groundwater is expected to be contaminated, the materials to be placed down the well and in contact with groundwater should be evaluated so that they are compatible with the chemical conditions expected in the well.
- 6.2 Equipment and materials used for well development may include, but is not limited to:
 

**Well development equipment**

  - Surge block

- Disposable Teflon bailers, appropriate to the diameter of the well(s): 1-inch to 1.5-inch for 2-inch inside diameter (ID) monitoring wells.
- Watterra® footvalve
- Electric submersible pump
- 12-volt power source for electric pump
- High density polyethylene (HDPE) tubing appropriately sized for Watterra® footvalve and/or electric submersible pump
- Drums or containers for storage of purge water
- Nephelometer to measure turbidity
- Multi-parameter water quality meter(s) to measure temperature, pH, conductivity, dissolved oxygen (DO), oxidation reduction potential (ORP)
- Instrument calibration solutions
- Water level meter
- Oil/water interface probe

#### **General equipment**

- Project-specific plans including the site-specific HASP and SAP
- Field notebook/field forms/site maps
- Indelible markers/pens
- 5-gallon buckets

#### **Equipment decontamination supplies** (refer to SOP 3-06, Equipment Decontamination)

- Health and safety supplies, including personal protective equipment (PPE)
- Appropriate hand tools
- Keys or combinations to access monitoring wells
- Distilled/deionized water supply
- Disposable bailer string (polypropylene)
- Plastic trash bags

## **7.0 Procedure**

Development generally consists of removing water and entrained sediment from the well until the water is clear (to the extent feasible) and the turbidity is reduced, which indicates the well is in good hydraulic connection with the surrounding formation. In addition to simply removing water, development can be improved when flushing through the well screen and gravel pack takes place in both directions, that is, both into the well and into the formation. This action breaks down sediment bridges that can occur in the formation or sand pack, which reduce the connection between the well and the formation

### **7.1 General Preparation**

- All down-well equipment should be decontaminated prior to use and between well locations in accordance with SOP 3-06, Equipment Decontamination
- Although equipment is decontaminated between well locations, if wells are known or suspected to be contaminated based on observations during well installation, it is recommended that well development be conducted in order from the least contaminated to the most contaminated well to minimize the chances of cross-contamination.
- Management of investigation-derived waste (IDW), including development purge water and miscellaneous expendable materials generated during the development process, will be conducted in accordance with SOP 3-05, IDW Management.



- Prior to accessing the well, the wellhead should be cleared of debris and/or standing water. Nothing from the ground surface should be allowed to enter the well.
- The depth to water and total well depth should be measured with a water level meter and recorded in the field logbook or on a Well Development Record (Attachment 1). This information will be used to calculate the volume of standing water (i.e., the well volume) within the well, and plan the specific details of the well development. If wells are suspected to contain NAPL, an oil/water interface probe should be used to measure liquid levels and depth to bottom of the well.
- Permanent monitoring wells will be developed no sooner than 24 hours after well installation is completed in order to allow well completion materials to set properly.

## 7.2 Monitoring Well Development Procedures

Generally, development will begin by gently surging the well with a surge block or bailer as described in Sections 7.2.1 and 7.2.2, respectively. Surging can become more vigorous as development progresses but initially the well must be gently surged to allow material blocking the screen to become suspended without damaging the well. Next, a bailer can be used to remove the sediment settled at the base of the well. A bailer, Watterra<sup>®</sup> pump, or electric submersible pump will then be used to purge the well, per Sections 7.2.2, 7.2.3, or 7.2.4, respectively. The well will be purged until the removed water becomes less turbid or per the requirements of the project-specific SAP, or State or local requirements. At this point the well will be surged again with a surge block or bailer. The well can be surged more vigorously at this point. After surging, the well will be purged again until the turbidity once again decreases. The surge/purge cycle should be completed at least three times during the development process. After the last surge, the well will be purged until the development completion criteria outlined in 7.3.2 or per the project-specific SAP are met.

### 7.2.1 Surge Block

The default method of well development is the use of a surge block in conjunction with pumping or bailing to remove sediment-laden water.

- The construction of the surge block must be appropriate for the diameter of the well. The surge block must be mounted on rods or other stiff materials to extend it to the appropriate depths and to allow for the surge block to be moved up and down in the well.
- Insert the surge block into the well and lower it slowly to the screened or open interval below the static water level. Start the surge action by slowly and gently moving the surge block up and down in the well. A slow initial surging, using plunger strokes of approximately 1 meter or 3 feet, will allow material which is blocking the screen to separate and become suspended.
- After 5 to 10 plunger strokes, remove water from the well using a separate bailer (Section 7.2.2) or pumping techniques (Sections 7.2.3 or 7.2.4). The returned water should be heavily laden with suspended fines. The water will be discharged to 5-gallon buckets or 55-gallon drums to be managed per the requirements presented in the project-specific SAP.
- In some cases, the bailer or Watterra<sup>®</sup> foot valve can act as a surge block, flushing water in and out of the well screen as groundwater is removed.
- Repeat the process of surging and pumping/bailing. As development continues, slowly increase the depth of surging to the bottom of the well screen. Surging within the riser portion of the well is neither necessary nor effective.

### 7.2.2 Bailer

- Tie a string or other cable securely to the bailer. Lower it to the screened or open interval of the monitoring well below the static water level.
- The bailer may be raised and lowered repeatedly within the screened interval to attempt to simulate the action of a surge block by pulling fines through the well screen, and pushing water out into the formation to break down bridging.



- With the bailer full of water, remove it from the well and discharge the water into 5-gallon buckets or 55-gallon drums to be managed per the requirements presented in the project-specific SAP.
- The Watterra® system (Section 7.2.3) or electric submersible pump (Section 7.2.4) may be used as a complementary development method to the bailer, especially when removal of additional water at a faster rate is beneficial.
- Continue alternately surging and bailing, monitoring the purge water periodically (Section 7.3.1) until development completion criteria are met (Section 7.3.2).

#### 7.2.3 Watterra® system

- Attach high-density polyethylene (HDPE) tubing to the decontaminated Watterra® pump foot valve
- Lower the foot valve and tubing assembly near the bottom of the well.
- Lift and lower the tubing to allow water to enter the Watterra® foot valve and travel up the tubing and discharge the water into 5-gallon buckets or 55-gallon drums to be managed per the requirements presented in the project-specific SAP.
- The lifting and lowering action of the Watterra® system will cause some surging action to aid in breaking up fine material in the surrounding formation.
- A bailer (Section 7.2.2) may be used as a complementary development method to the Watterra® system, especially during the initial stages of development when a high volume of sediment may be required to be removed.
- An electric submersible pump (Section 7.2.4) may also be used as a complementary development method to the Watterra® system, especially when more volume of water is desired to be pumped or the turbidity criteria cannot be met due to the surging action of the Watterra® system.
- Continue alternately surging and pumping, monitoring the purge water periodically (Section 7.3.1) until well development completion criteria are met (Section 7.3.2).

#### 7.2.4 Electric Submersible Pump

- Attach HDPE tubing to the decontaminated electric submersible pump.
- Lower the pump and tubing assembly near the bottom of the well, at least a few inches above the well total depth.
- Begin pumping, discharging the water into 5-gallon buckets or 55-gallon drums to be managed per the requirements presented in the project-specific SAP.
- Continue alternately surging and pumping, monitoring the purge water discharge periodically (Section 7.3.1) until well development completion criteria are met (Section 7.3.2).

### 7.3 Discharge Monitoring

#### 7.3.1 Monitoring the Progress of Development

The progress of the development is evaluated through visual observation of the suspended sediment load and measurement of the turbidity and other parameters in the purged discharge water. As development progresses, the water should become clearer, measured turbidity should decrease, and specific capacity (pumping rate divided by drawdown) should stabilize. Water quality parameters, including DO, conductivity, ORP, pH, temperature, and turbidity may be measured and recorded periodically to determine the progress of development using the criteria outlined in Section 7.3.2 or per the project-specific SAP. Water quality parameters should be measured on each well volume removed.

#### 7.3.2 Completion of Development

The well will be considered developed when the following criteria are met or per the criteria set forth in the project-specific SAP:

- A minimum of three times the standing water volume in a well (to include the well screen and casing plus saturated annulus, assuming 30 percent porosity) is removed.

- Groundwater parameters for three consecutive standing water volumes are within the following:
  - pH – within  $\pm 0.2$  units
  - Specific conductivity – within  $\pm 3\%$
  - ORP – within  $\pm 10$  mV
  - Temperature – within  $\pm 1$  degree Celsius
  - Turbidity – at or below 10 nephelometric turbidity units (NTU) or within  $\pm 10\%$  if above 10 NTU.
- The sediment thickness remaining within the well is less than 1 percent of the screen length or less than 30 millimeters (0.1 ft) for screens equal to or less than 10 feet long.

Dissolved oxygen (DO) readings may be recorded but DO readings will not be used as development completion criteria because DO may not stabilize.

If the well has slow groundwater recharge and is purged dry, the well will be considered developed when bailed or pumped dry three times in succession and the turbidity has decreased, or per the requirements set forth in the project-specific SAP. Water quality parameters may be recorded if feasible using the flow-through cell.

If any water is added to the well's borehole during development or drilling, three times the volume of water added will also be removed during well development, or per the requirements set forth in the project-specific SAP.

#### 7.4 Development of Wells with Low Yield

Water is the primary mechanism to remove fines and flush water through the gravel pack for effective development. Therefore, development can be a challenge in wells that do not yield sufficient water to recharge when water is removed. However, often these wells are the most in need of development to improve their performance as they are typically installed in low permeability formations with a high content of fines. Development of these wells can improve their yield.

The surging portion of the development can be successfully performed in a well with standing water regardless of its yield. It is the subsequent removal of fine materials that is hindered when insufficient water is recharged to the well. When wells go dry or drawdown significantly during development, development can be performed intermittently, allowing sufficient water to recharge prior conducting the next stage of surging. These intermittent procedures can take place hours or even days apart, depending on project-specific time constraints.

#### 7.5 Wells containing NAPL

Additional care should be taken when planning development of wells that contain NAPL. If the NAPL is flammable, there are health and safety as well as handling issues to consider. If NAPL in excess of a persistent sheen is noted, the recharge rate will be evaluated through hand bailing. In most cases, it is generally preferable to remove NAPL by bailing to the extent practical prior to performing development. Groundwater parameters, excluding turbidity, will not be collected during well development if NAPL or excessive sheen is noticed in the purged water during development to ensure the meter probes are not fouled or destroyed. Well development will be halted.

Development by surging or pumping the well dry can result in the spreading of NAPL vertically in the soil column around the well. These methods can be used, if information exists describing the vertical thickness of the NAPL smear zone around the well, and if the methods do not result in mounding or drawdown that exceeds this thickness. Alternate methods such as bailing may also be used, but any method should not allow the well to be pumped dry or result in significant drawdown that would spread the NAPL vertically.

## 7.6 Temporary Well Points

For certain projects, temporary well points (TWP) may be installed to collect groundwater samples at a site. Since no sand pack, bentonite chips, or bentonite grout are generally used in the construction of the TWPs, development can proceed as soon as sufficient water has entered the well to static conditions. Due to the small diameter of these wells, generally 3/4-inch to 1-inch ID, development will be performed using either a small diameter (0.5-inch) bailer and/or a peristaltic pump with dedicated tubing. The TWPs will have minimal water column and may purge dry during development. However, attempts will be made to remove fines from the well prior to sampling. Purging and sampling may occur as soon as approximately 80% of the static water has re-entered the TWP, or per the requirements set forth in the project-specific SAP.

## 8.0 Quality Control and Assurance

- 8.1 Field personnel will follow specific quality assurance (QA) guidelines as outlined in the project-specific SAP.
- 8.2 Quality control (QC) requirements are dependent on project-specific sampling objectives. The project-specific SAP will provide requirements for equipment decontamination (frequency and materials) and IDW handling.

## 9.0 Records, Data Analysis, Calculations

- 9.1 All data and information (e.g., development method used) must be documented on field data sheets (Attachment 1) or within site logbooks with permanent ink. Data recorded may include the following:
  - Well Location
  - Weather conditions
  - Date and Time
  - Purge Method
  - Reading/measurements obtained

## 10.0 Attachments or References

Attachment 1 – Well Development Record

SOP 3-05, *IDW Management*.

SOP 3-06, *Equipment Decontamination*.

<i>Author</i>	<i>Reviewer</i>	<i>Revisions (Technical or Editorial)</i>
Shawn Dolan Senior Scientist	Chris Barr Program Quality Manager	Rev 0 – Initial Issue (June 2012)



# Monitoring Well Sampling

## Procedure 3-14

### 1.0 Purpose and Scope

- 1.1 This standard operating procedure (SOP) describes the actions to be used during monitoring well sampling activities and establishes the method for sampling groundwater monitoring wells for water-borne contaminants and general groundwater chemistry. The objective is to obtain groundwater samples that are representative of aquifer conditions with as little alteration to water chemistry as possible.
- 1.2 This procedure is the Program-approved professional guidance for work performed by AECOM under contract to the United States Army Corp of Engineers (USACE).
- 1.3 As guidance for specific activities, this procedure does not obviate the need for professional judgment. Deviations from this procedure while planning or executing planned activities must be approved in accordance with Program requirements for technical planning and review.

### 2.0 Safety

- 2.1 Depending upon the site-specific contaminants, various protective programs must be implemented prior to sampling the first well. All field sampling personnel responsible for sampling activities must review the project-specific Accident Prevention Plan (APP) and Site Safety and Health Plan (SSHP), paying particular attention to the control measures planned for the well sampling tasks. Conduct preliminary area monitoring of sampling wells to determine the potential hazard to field sampling personnel. If significant contamination is observed, minimize contact with potential contaminants in both the vapor phase and liquid matrix through the use of appropriate personal protective equipment (PPE).
- 2.2 Observe standard health and safety practices according to the project-specific APP/SSHP. Suggested minimum protection during well sampling activities includes inner disposable vinyl gloves, outer chemical-protective nitrile gloves and rubberized steel-toed boots. Half-face respirators and cartridges and Tyvek® suits may be necessary depending on the contaminant concentrations. Refer to the project-specific APP/SSHP for the required PPE.
- 2.3 Physical Hazards associated with Well Sampling
  - To avoid lifting injuries associated with pump and bailers retrieval, use the large muscles of the legs, not the back.
  - Stay clear of all moving equipment, and avoid wearing loose fitting clothing.
  - When using tools for cutting purposes, cut away from yourself. The use of appropriate, task specific cutting tools is recommended.
  - To avoid slip/trip/fall conditions as a result of pump discharge, use textured boots/boot cover bottoms.
  - To avoid heat/cold stress as a result of exposure to extreme temperatures and PPE, drink electrolyte replacement fluids (1 to 2 cups per hour is recommended) and, in cases of extreme cold, wear fitted insulating clothing.
  - Be aware of restricted mobility due to PPE.

### 3.0 Terms and Definitions

None.

### 4.0 Interferences

4.1 Potential interferences could result from cross-contamination between samples or sample locations. Minimization of the cross-contamination will occur through the following:

- The use of clean sampling tools at each location as necessary.
- Avoidance of material that is not representative of the media to be sampled.

### 5.0 Training and Qualifications

#### 5.1 Qualifications and Training

The individual executing these procedures must have read, and be familiar with, the requirements of this SOP.

#### 5.2 Responsibilities

- 5.2.1 The **Project Manager** is responsible for ensuring that monitoring well sampling activities comply with this procedure. The **Project Manager** is responsible for ensuring that all field sampling personnel involved in monitoring well sampling shall have the appropriate education, experience, and training to perform their assigned tasks.
- 5.2.2 The **Program Quality Manager** is responsible for ensuring overall compliance with this procedure.
- 5.2.3 The **Site Supervisor (SS)** is responsible for ensuring that all field sampling personnel follow these procedures.
- 5.2.4 **Field sampling personnel** are responsible for the implementation of this procedure.
- 5.2.5 The field sampler and/or task manager is responsible for directly supervising the groundwater sampling procedures to ensure that they are conducted according to this procedure and for recording all pertinent data collected during sampling.

### 6.0 Equipment and Supplies

#### 6.1 Purging and Sampling Equipment

- Pump (Peristaltic, Portable Bladder, Submersible)
- Polyethylene or Teflon bladders (for portable bladder pumps)
- Bladder pump controller (for portable bladder pumps)
- Air compressor (for portable bladder pumps)
- Nitrogen cylinders (for portable bladder pumps)
- 12-volt power source
- Polyethylene inlet and discharge tubing (except for VOC analysis which requires Teflon tubing)
- Silicone tubing appropriate for peristaltic pump head
- Teflon bailer appropriately sized for well

- Disposable bailer string (polypropylene)
- Individual or multi-parameter water quality meter(s) with flow-through cell to measure temperature, pH, specific conductance, dissolved oxygen (DO), oxidation reduction potential (ORP), and/or turbidity
- Turbidity meter
- Water level meter
- Oil/water interface probe

## 6.2 General Equipment

- Sample kit (i.e., bottles, labels, preservatives, custody records and tape, cooler, ice)
- Sample Chain-of-Custody (COC) forms
- Sample Collection Records
- Sample packaging and shipping supplies
- Waterproof marker or paint
- Distilled/deionized water supply
- Water dispenser bottles
- Flow measurement cup or bucket
- 5-gallon buckets
- Instrument calibration solutions
- Stopwatch or watch
- Disposable Nitrile gloves
- Paper towels
- Trash bags
- Zipper-lock bags
- Equipment decontamination supplies
- Health and safety supplies (as required by the APP/SSHP)
- Approved plans such as: project-specific APP/SSHP and SAP
- Well keys or combinations
- Monitoring well location map(s)
- Field project logbook/pen

## 7.0 Calibration or Standardization

- 7.1 Field instruments will be calibrated daily according to the requirements of the SAP and manufacturer's specifications for each piece of equipment. Equipment will be checked daily with the calibration solutions at the end of use of the equipment. Calibration records shall be recorded in the field logbook or appropriate field form.
- 7.2 If readings are suspected to be inaccurate, the equipment shall be checked with the calibration solutions and/or re-calibrated.



## **8.0 Procedure**

### **8.1 Preparation**

#### **8.1.1 Site Background Information**

Establish a thorough understanding of the purposes of the sampling event prior to field activities. Conduct a review of all available data obtained from the site and pertinent to the water sampling. Review well history data including, but not limited to, well locations, sampling history, purging rates, turbidity problems, previously used purging methods, well installation methods, well completion records, well development methods, previous analytical results, presence of an immiscible phase, historical water levels, and general hydrogeologic conditions.

Previous groundwater development and sampling logs give a good indication of well purging rates and the types of problems that might be encountered during sampling, such as excessive turbidity and low well yield. They may also indicate where dedicated pumps are placed in the water column. To help minimize the potential for cross-contamination, well purging and sampling and water level measurement collection shall proceed from the least contaminated to the most contaminated well as indicated by previous analytical results. This order may be changed in the field if conditions warrant it, particularly if dedicated sampling equipment is used. A review of prior sampling procedures and results may also identify which purging and sampling techniques are appropriate for the parameters to be tested under a given set of field conditions.

#### **8.1.2 Groundwater Analysis Selection**

Establish the requisite field and laboratory analyses prior to water sampling. Decide on the types and numbers of quality assurance/quality control (QA/QC) samples to be collected (refer to the project-specific SAP), as well as the type and volume of sample preservatives, the type and number of sample containers, the number of coolers required, and the quantity of ice or other chilling materials. The field sampling personnel shall ensure that the appropriate number and size sample containers are brought to the site, including extras in case of breakage or unexpected field conditions. Refer to the project-specific SAP for the project analytical requirements.

### **8.2 Groundwater Sampling Procedures**

Groundwater sampling procedures at a site shall include:

- 1) An evaluation of the well security and condition prior to sampling;
- 2) Decontamination of equipment;
- 3) Measurement of well depth to groundwater;
- 4) Assessment of the presence or absence of an immiscible phase;
- 5) Assessment of purge parameter stabilization;
- 6) Purging of static water within the well and well bore; and
- 7) Obtaining a groundwater sample.

Each step is discussed in sequence below. Depending upon specific field conditions, additional steps may be necessary. As a rule, at least 24 hours should separate well development and well sampling events. In all cases, consult the State and local regulations for the site, which may require more stringent time separation between well development and sampling.



### 8.2.1 Well Security and Condition

At each monitoring well location, observe the conditions of the well and surrounding area. The following information may be noted on a Groundwater Sample Collection Record (Attachment 1) or in the field logbook:

- Condition of the well's identification marker.
- Condition of the well lock and associated locking cap.
- Integrity of the well – well pad condition, protective outer casing, obstructions or kinks in the well casing, presence of water in the annular space, and the top of the interior casing.
- Condition of the general area surrounding the well.

### 8.2.2 Decontamination of Equipment

Where possible, dedicated supplies should be used at each well location to minimize the potential for cross-contamination and minimize the amount of investigation derived waste (IDW) fluids resulting from the decontamination process. If decontamination is necessary, establish a decontamination station before beginning sampling. The station shall consist of an area of at least 4 feet by 2 feet covered with plastic sheeting and be located upwind of the well being sampled. The station shall be large enough to fit the appropriate number of wash and rinse buckets, and have sufficient room to place equipment after decontamination. One central cleaning area may be used throughout the entire sampling event. The area around the well being sampled shall also be covered with plastic sheeting to prevent spillage. Further details are presented in SOP 3-06, Equipment Decontamination.

Decontaminate each piece of equipment prior to entering the well. Also, conduct decontamination prior to sampling at a site, even if the equipment has been decontaminated subsequent to its last usage. Additionally, decontaminate each piece of equipment used at the site prior to leaving the site. It is only necessary to decontaminate dedicated sampling equipment prior to installation within the well. Do not place clean sampling equipment directly on the ground or other contaminated surfaces prior to insertion into the well. Dedicated sampling equipment that has been certified by the manufacturer as being decontaminated can be placed in the well without on-site decontamination.

### 8.2.3 Measurement of Static Water Level Elevation

Before purging the well, measure water levels in all of the wells within the zone of influence of the well being purged. The best practice, if possible, is to measure all site wells (or wells within the monitoring well network) prior to sampling. If the well cap is not vented, remove the cap several minutes before measurement to allow water levels to equilibrate to atmospheric pressure.

Measure the depth to standing water and the total depth of the well to the nearest 0.01 foot to provide baseline hydrologic data, to calculate the volume of water in the well, and to provide information on the integrity of the well (e.g., identification of siltation problems). If not already present, mark an easily identified reference point for water level measurements which will become the measuring point for all water level measurements. This location and elevation must be surveyed.

The device used to measure the water level surface and depth of the well shall be sufficiently sensitive and accurate in order to obtain a measurement to the nearest 0.01 foot reliably. An electronic water level meter will usually be appropriate for this measurement; however, when the groundwater within a particular well is highly contaminated, an inexpensive weighted tape measure can be used to determine well depth to prevent adsorption of contaminants onto the meter tape. The presence of light, non-aqueous phase liquids (LNAPLs) and/or dense, non-aqueous phase liquids (DNAPLs) in a well requires measurement of the elevation of the top and the bottom of the product, generally using an interface probe. Water levels in such wells must then be corrected for density effects to accurately determine the elevation of the water table.

At each location, measure water levels several times in quick succession to ensure that the well has equilibrated to atmospheric conditions prior to recording the measurement. As stated above, measure all site wells (or wells within the monitoring well network) prior to sampling whenever possible. This will provide a water level database that describes water levels across the site at one time (a synoptic sampling). Prior to sampling, measure the water level in each well immediately prior to purging the well to ascertain that static conditions have been achieved prior to sampling.

#### 8.2.4 Detection of Immiscible Phase Layers

Complete the following steps for detecting the presence of LNAPL and DNAPL before the well is purged for conventional sampling. These procedures may not be required for all wells. Consult the project-specific SAP to determine if assessing the presence of LNAPL and/or DNAPL is necessary.

- 1) Sample the headspace in the wellhead immediately after the well is opened for organic vapors using either a PID or an organic vapor analyzer, and record the measurements.
- 2) Lower an interface probe into the well to determine the existence of any immiscible layer(s), LNAPL and/or DNAPL, and record the measurements.
- 3) Confirm the presence or absence of an immiscible phase by slowly lowering a clear bailer to the appropriate depth, then visually observing the results after sample recovery.
- 4) In rare instances, such as when very viscous product is present, it may be necessary to utilize hydrocarbon- and water-sensitive pastes for measurement of LNAPL thickness. This is accomplished by smearing adjacent, thin layers of both hydrocarbon- and water-sensitive pastes along a steel measuring tape and inserting the tape into the well. An engineering tape showing tenths and hundredths of feet is required. Record depth to water, as shown by the mark on the water-sensitive paste, and depth to product, as shown by the mark on the product-sensitive paste. In wells where the approximate depth to water and product thickness are not known, it is best to apply both pastes to the tape over a fairly long interval (5 feet or more). Under these conditions, measurements are obtained by trial and error and may require several insertions and retrievals of the tape before the paste-covered interval of the tape encounters product and water. In wells where approximate depths of air-product and product-water interfaces are known, pastes may be applied over shorter intervals. Water depth measurements should not be used in preparation of water table contour maps until they are corrected for depression by the product.
- 5) If the well contains an immiscible phase, it may be desirable to sample this phase separately. Section 8.2.6 presents immiscible phase sampling procedures. It may not be meaningful to conduct water sample analysis of water obtained from a well containing LNAPLs or DNAPLs. Consult the **Project Manager** and **Program Quality Manager** if this situation is encountered.

#### 8.2.5 Purging Equipment and Use

##### **General Requirements**

The water present in a well prior to sampling may not be representative of in situ groundwater quality and shall be removed prior to sampling. Handle all groundwater removed from potentially contaminated wells in accordance with the IDW handling procedures in SOP 3-05, IDW Management. Purging shall be accomplished by methods as indicated in the project-specific SAP or by those required by State requirements. For the purposes of this SOP, purging methods will be described by removing groundwater from the well using low-flow techniques.

According to the U.S. Environmental Protection Agency (EPA) (EPA, 1996), the rate at which groundwater is removed from the well during purging ideally should be less than 0.2 to 0.3 liters/minute. EPA further states that wells should be purged at rates below those used to develop the well to prevent further development of the well, to prevent damage to the well, and to avoid disturbing accumulated

corrosion or reaction products in the well. EPA also indicates that wells should be purged at or below their recovery rate so that migration of water in the formation above the well screen does not occur.

Realistically, the purge rate should be low enough that substantial drawdown in the well does not occur during purging. In addition, a low purge rate will reduce the possibility of stripping volatile organic compounds (VOCs) from the water, and will reduce the likelihood of increasing the turbidity of the sample due to mobilizing colloids in the subsurface that are immobile under natural flow conditions.

The field sampler shall ensure that purging does not cause formation water to cascade down the sides of the well screen. Wells should not be purged to dryness if recharge causes the formation water to cascade down the sides of the screen, as this will cause an accelerated loss of volatiles. This problem should be anticipated based on the results of either the well development task or historical sampling events. In general, place the intake of the purge pump in the middle of the saturated screened interval within the well to allow purging and at the same time minimize disturbance/overdevelopment of the screened interval in the well. Water shall be purged from the well at a rate that does not cause recharge water to be excessively agitated unless an extremely slow recharging well is encountered where complete evacuation is unavoidable. During the well purging procedure, collect water level and/or product level measurements to assess the hydraulic effects of purging. Sample the well when it recovers sufficiently to provide enough water for the analytical parameters specified. If the well is purged dry, allow the well to recover sufficiently to provide enough water for the specified analytical parameters, and then sample it.

Evaluate water samples on a regular basis during well purging and analyze them in the field preferably using in-line devices (i.e., flow through cell) for temperature, pH, specific conductivity, dissolved oxygen (DO), and oxidation-reduction (redox) potential. Turbidity should be measured separately (outside of the flow-through cell) with a nephelometer or similar device.

Readings should be taken every 2 to 5 minutes during the purging process. These parameters are measured to demonstrate that the natural character of the formation waters has been restored.

Purging shall be considered complete per the requirements set forth in the project-specific SAP, State requirements, or when three consecutive field parameter measurements of temperature, pH, specific conductivity, DO and ORP stabilize within approximately 10 percent and the turbidity is at or below 10 nephelometric turbidity units (NTU) or within  $\pm 10\%$  if above 10 NTU. This criterion may not be applicable to temperature if a submersible pump is used during purging due to the heating of the water by the pump motor. Enter all information obtained during the purging and sampling process into a groundwater sampling log. Attachment 1 shows an example of a groundwater sampling log and the information typically included in the form. Whatever form is used, all blanks need to be completed on the field log during field sampling.

Groundwater removed during purging shall be stored according to the project-specific SAP or per SOP 3-05, IDW Management.

### **Purging Equipment and Methods**

#### ***Submersible Pump***

A stainless steel submersible pump may be utilized for purging both shallow and deep wells prior to sampling the groundwater for semivolatile and non-volatile constituents, but are generally not preferred for VOCs unless there are no other options (e.g., well over 200 feet deep). For wells over 200 feet deep, the submersible pump is one of the few technologies available to feasibly accomplish purging under any yield conditions. For shallow wells with low yields, submersible pumps are generally inappropriate due to overpumpage of the wells (<1 gallon per minute), which causes increased aeration of the water within the well.

Steam clean or otherwise decontaminate the pump and discharge tubing prior to placing the pump in the well. The submersible pump shall be equipped with an anti-backflow check valve to limit the amount of

water that will flow back down the drop pipe into the well. Place the pump in the middle of the saturated screened interval within the well and maintain it in that position during purging.

#### ***Bladder Pump***

A stainless steel bladder pump can be utilized for purging and sampling wells up to 200 feet in depth for volatile, semivolatile, and non-volatile constituents. Use of the bladder pump is most effective in low to moderate yield wells and are often the preferred method for low-flow sampling. When sampling for VOCs and/or SVOCs, Teflon bladders should be used. Polyethylene bladders may be used when sampling for inorganics.

Either compressed dry nitrogen or compressed dry air, depending upon availability, can operate the bladder pump. The driving gas utilized must be dry to avoid damage to the bladder pump control box. Decontaminate the bladder pump prior to use.

#### ***Centrifugal, Peristaltic, or Diaphragm Pump***

A centrifugal, peristaltic, or diaphragm pump may be utilized to purge a well if the water level is within 20 feet of ground surface. New or dedicated tubing is inserted into the midpoint of the saturated screened interval of the well. Water should be purged at a rate that satisfies low-flow requirements (i.e., does not cause drawdown). Centrifugal, peristaltic, or diaphragm pump are generally discouraged for VOCs sampling; however, follow methods allowed per the project-specific SAP or State requirements.

#### ***Air Lift Pump***

Airlift pumps are not appropriate for purging or sampling.

#### ***Bailer***

Avoid using a bailer to purge a well because it can result in overdevelopment of the well and create excessive purge rates. If a bailer must be used, the bailer should either be dedicated or disposable. Teflon-coated cable mounted on a reel is recommended for lowering the bailer in and out of the well.

Lower the bailer below the water level of the well with as little disturbance of the water as possible to minimize aeration of the water in the well. One way to gauge the depth of water on the reel is to mark the depth to water on the bailer wire with a stainless steel clip. In this manner, less time is spent trying to identify the water level in the well.

### **8.2.6 Monitoring Well Sampling Methodologies**

#### **Sampling Light, Non-Aqueous Phase Liquids (LNAPL)**

Collect LNAPL, if present, prior to any purging activities. The sampling device shall generally consist of a dedicated or disposable bailer equipped with a bottom-discharging device. Lower the bailer slowly until contact is made with the surface of the LNAPL, and to a depth less than that of the immiscible fluid/water interface depth as determined by measurement with the interface probe. Allow the bailer to fill with LNAPL and retrieve it.

When sampling LNAPLs, never drop bailers into a well and always remove them from the well in a manner that causes as little agitation of the sample as possible. For example, the bailer should not be removed in a jerky fashion or be allowed to continually bang against the well casing as it is raised. Teflon bailers should always be used when sampling LNAPL. The cable used to raise and lower the bailer shall be composed of an inert material (e.g., stainless steel) or coated with an inert material (e.g., Teflon).

#### **Sampling Dense, Non-Aqueous Phase Liquids (DNAPL)**

Collect DNAPL prior to any purging activities. The best method for collecting DNAPL is to use a double-check valve, stainless steel bailer, or a Kemmerer (discrete interval) sampler. The sample shall be collected by slow, controlled lowering of the bailer to the bottom of the well, activation of the closing device, and retrieval.

### **Groundwater Sampling Methodology**

The well shall be sampled when groundwater within it is representative of aquifer conditions per the methods described in Section 8.2.5. Prior to sampling the flow-through cell shall be removed and the samples collected directly from the purge tubing. Flow rates shall not be adjusted once aquifer conditions are met. Additionally, a period of no more than 2 hours shall elapse between purging and sampling to prevent groundwater interaction with the casing and atmosphere. This may not be possible with a slowly recharging well. Measure and record the water level prior to sampling in order to monitor drawdown when using low-flow techniques and gauge well volumes removed and recharged when using non-low-flow techniques.

Sampling equipment (e.g., especially bailers) shall never be dropped into the well, as this could cause aeration of the water upon impact. Additionally, the sampling methodology utilized shall allow for the collection of a groundwater sample in as undisturbed a condition as possible, minimizing the potential for volatilization or aeration. This includes minimizing agitation and aeration during transfer to sample containers, minimizing exposure to sunlight, and immediately placing the sample on ice once collected.

Sampling equipment shall be constructed of inert material. Equipment with neoprene fittings, polyvinyl chloride (PVC) bailers, Tygon® tubing, silicon rubber bladders, neoprene impellers, polyethylene, and Viton® are not acceptable when sampling for organics. If bailers are used, an inert cable/chain (e.g., fluorocarbon resin-coated wire or stainless steel wire or cable) shall be used to raise and lower the bailer. Dedicated equipment is highly recommended for all sampling programs.

#### ***Submersible Pumps***

The submersible pump must be specifically designed for groundwater sampling (i.e., pump composed of stainless steel and Teflon, sample discharge lines composed of Teflon) and must have a controller mechanism allowing the required low-flow rate. Adjust the pump rate so that flow is continuous and does not pulsate to avoid aeration and agitation within the sample discharge lines. Run the pump for several minutes at the low-flow rate used for sampling to ensure that the groundwater in the lines was obtained at the low-flow rate.

#### ***Bladder Pumps***

A gas-operated stainless steel bladder pump with adjustable flow control and equipped with a Teflon bladder and Teflon-lined tubing can be effectively utilized to collect a groundwater sample and is considered to be the best overall device for sampling inorganic and organic constituents. If only inorganics are being sampled, polyvinyl bladders and tubing may be used. Operate positive gas displacement bladder pumps in a continuous manner so that they minimize discharge pulsation that can aerate samples in the return tube or upon discharge.

When using a compressor, take several precautions. If the compressor is being powered by a gasoline generator, position the generator downwind of the well. Ground fault circuit interrupters (GFCIs) should always be used when using electric powered equipment. Do not connect the compression hose from the compressor to the pump controller until after the engine has been started.

When all precautions are completed and the compressor has been started, connect the compression hose to the pump controller. Slowly adjust the control knobs to discharge water in the shortest amount of time while maintaining a near constant flow. This does not mean that the compressor must be set to discharge the water as hard as possible. The optimal setting is one that produces the largest volume of purge water per minute (not per purge cycle) while maintaining a near constant flow rate.

Prior to sampling, adjust the flow rate (purge rate) to yield 100 to 300 mL/minute. Avoid settings that produce pulsating streams of water instead of a steady stream if possible. Operate the pump at this low flow rate for several minutes to ensure that drawdown is not occurring. At no time shall the sample flow rate exceed the flow rate used while purging.

For those samples requiring filtration, it is recommended to use an in-line high capacity filter after all non-filtered samples have been collected.

#### **Peristaltic Pumps:**

A peristaltic pump is a type of positive displacement pump that moves water via the process of peristalsis. The pump uses a flexible hose fitted inside a circular pump casing. A rotor with cams compresses the flexible tube as the rotor turns, which forces the water to be pumped to move through the tube. In peristaltic pumps, no moving parts of the pump are in contact with the water being pumped. Displacement is determined by tube size, so delivery rate can only be changed during operation by varying pump speed. Peristaltic pumps are simple and quite inexpensive for the flow rates they provide.

There are several methods available for transferring the sample into the laboratory containers. The selected method may vary based on State requirements and should be documented in the project-specific SAP. Samples typically can be collected directly from the discharge end of the Teflon tubing, after it has been disconnected from the flow through cell. For volatile analyses, the sampler should make sure that the pump is set such that a smooth laminar flow is achieved. In all cases, the project team should consult their local regulatory requirements and document the selected sample collection procedure in the project-specific SAP.

#### **Bailers**

A single- or double-check valve Teflon or stainless steel bailer equipped with a bottom discharging device can be utilized to collect groundwater samples. Bailers have a number of disadvantages, however, including a tendency to alter the chemistry of groundwater samples due to degassing, volatilization, and aeration; the possibility of creating high groundwater entrance velocities; differences in operator techniques resulting in variable samples; and difficulty in determining where in the water column the sample was collected. Therefore, use bailers for groundwater sampling only when other types of sampling devices cannot be utilized for technical, regulatory, or logistical reasons.

Dedicated or disposable bailers should always be used in order to eliminate the need for decontamination and to limit the potential of cross-contamination. Each time the bailer is lowered to the water table, lower it in such a way as to minimize disturbance and aeration of the water column within the well.

#### **8.2.7 Sample Handling and Preservation**

Many of the chemical constituents and physiochemical parameters to be measured or evaluated during groundwater monitoring programs are chemically unstable and require preservation. The U.S. EPA document entitled, *Test Methods for Evaluating Solid Waste – Physical/Chemical Methods (SW-846)* (EPA 1997), includes a discussion of appropriate sample preservation procedures. In addition, SW-846 provides guidance on the types of sample containers to use for each constituent or common set of parameters. In general, check with specific laboratory or State requirements prior to obtaining field samples. In many cases, the laboratory will supply the necessary sample bottles and required preservatives. In some cases, the field sampling personnel may add preservatives in the field.

Improper sample handling may alter the analytical results of the sample. Therefore, transfer samples in the field from the sampling equipment directly into the container that has been prepared specifically for that analysis or set of compatible parameters as described in the project-specific SAP. It is not an acceptable practice for samples to be composited in a common container in the field and then split in the laboratory, or poured first into a wide mouth container and then transferred into smaller containers.

Collect groundwater samples and place them in their proper containers in the order of decreasing volatility and increasing stability. A preferred collection order for some common groundwater parameters is:

1. VOCs and total organic halogens (TOX)



2. Dissolved gases, total organic carbon (TOC), total fuel hydrocarbons
3. Semivolatile organics, pesticides
4. Total metals, general minerals (unfiltered)
5. Dissolved metals, general minerals (filtered)
6. Phenols
7. Cyanide
8. Sulfate and chloride
9. Nitrate and ammonia
10. Radionuclides

When sampling for VOCs, collect water samples in vials or containers specifically designed to prevent loss of VOCs from the sample. The analytical laboratory performing the analysis shall provide these vials. Collect groundwater from the sampling device in vials by allowing the groundwater to slowly flow along the sides of the vial. Sampling equipment shall not touch the interior of the vial. Fill the vial above the top of the vial to form a positive meniscus with no overflow. No headspace shall be present in the sample container once the container has been capped. This can be checked by inverting the bottle once the sample is collected and tapping the side of the vial to dislodge air bubbles. Sometimes it is not possible to collect a sample without air bubbles, particularly water that has high concentrations of dissolved gasses. In these cases, the field sampling personnel shall document the occurrence in the field logbook and/or sampling worksheet at the time the sample was collected. Likewise, the analytical laboratory shall note in the laboratory analysis reports any headspace in the sample container(s) at the time of receipt by the laboratory.

### **Special Handling Considerations**

In general, samples for organic analyses should not be filtered. However, high turbidity samples for PCB analysis may require filtering. Consult the project-specific SAP for details on filtering requirements. Samples shall not be transferred from one container to another because this could cause aeration or a loss of organic material onto the walls of the container. TOX and TOC samples should be handled in the same manner as VOC samples.

When collecting total and dissolved metals samples, the samples should be collected sequentially. The total metals sample is collected from the pump unfiltered. The dissolved metals sample is collected after filtering with a 0.45-micron membrane in-line filter. Allow at least 500 mL of effluent to flow through the filter prior to sampling to ensure that the filter is thoroughly wetted and seated in the filter capsule. If required by the project-specific SAP, include a filter blank for each lot of filters used and always record the lot number of the filters.

### **Field Sampling Preservation**

Preserve samples immediately upon collection. Ideally, sampling containers will be pre-preserved with a known concentration and volume of preservative. Certain matrices that have alkaline pH (greater than 7) may require more preservative than is typically required. An early assessment of preservation techniques, such as the use of pH strips after initial preservation, may therefore be appropriate. Guidance for the preservation of environmental samples can be found in the U.S. EPA *Handbook for Sampling and Sample Preservation of Water and Wastewater* (EPA 1982). Additional guidance can be found in other U.S. EPA documents (EPA 1992, 1996).

### **Field Sampling Log**

A groundwater sampling log provided as Attachment 1 shall document the following:

- Identification of well

- Well depth
- Static water level depth and measurement technique
- Presence of immiscible layers and detection method
- Well yield
- Purge volume and pumping rate
- Time that the well was purged
- Sample identification numbers
- Well evacuation procedure/equipment
- Sample withdrawal procedure/equipment
- Date and time of collection
- Types of sample containers used
- Preservative(s) used
- Parameters requested for analysis
- Field analysis data
- Field observations on sampling event
- Name of sampler
- Weather conditions

## **9.0 Quality Control and Assurance**

- 9.1 Field personnel will follow specific quality assurance (QA) guidelines as outlined in the project-specific SAP. The goal of the QA program should be to ensure precision, accuracy, representativeness, completeness, and comparability in the project sampling program.
- 9.2 Quality control (QC) requirements for sample collection are dependent on project-specific sampling objectives. The project-specific SAP will provide requirements for sample preservation and holding times, container types, sample packaging and shipment, as well as requirements for the collection of various QC samples such as trip blanks, field blanks, equipment rinse blanks, and field duplicate samples.

## **10.0 Data and records management**

- 10.1 Records will be maintained in accordance with SOP 3-03, Recordkeeping, Sample Labelling, and Chain-of-Custody. Various forms are required to ensure that adequate documentation is made of the sample collection activities. These forms may include:
- Sample Collection Records;
  - Field logbook;
  - Chain-of-custody forms; and
  - Shipping labels.



- 10.2 Sample collection records (Attachment 1) will provide descriptive information for the purging process and the samples collected at each monitoring well.
- 10.3 The field logbook is kept as a general log of activities and should not be used in place of the sample collection record.
- 10.4 Chain-of-custody forms are transmitted with the samples to the laboratory for sample tracking purposes.
- 10.5 Shipping labels are required is sample coolers are to be transported to a laboratory by a third party (courier service).

## 11.0 Attachments or References

### Attachment 1 – Groundwater Sampling Collection Record

ASTM Standard D5088. 2008. *Standard Practice for Decontamination of Field Equipment Used at Waste Sites*. ASTM International, West Conshohocken, PA. 2008. DOI: 10.1520/D5088-02R08. [www.astm.org](http://www.astm.org).

Environmental Protection Agency, United States (EPA). 1982. *Handbook for Sampling and Sample Preservation of Water and Wastewater*. EPA-600/4-82-029. Cincinnati: EPA Office of Research and Development, Environmental Monitoring and Support Laboratory.

EPA. 1992. *RCRA Groundwater Monitoring Draft Technical Guidance*. EPA/530/R-93/001. Office of Solid Waste. November.

EPA. 1996. *Ground Water Issue: Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures*. EPA/540/S-95/504. Office of Solid Waste and Emergency Response. April.

EPA. 1997. *Test Methods for Evaluating Solid Waste, Physical/Chemical Method (SW-846)*. 3rd ed., Final Update IIIA. Office of Solid Waste. Online updates at: <http://www.epa.gov/epaoswer/hazwaste/test/new-meth.htm>.

SOP 3-03, *Recordkeeping, Sample Labelling, and Chain-of-Custody*.

SOP 3-05, *IDW Management*.

SOP 3-06, *Equipment Decontamination*.

Author	Reviewer	Revisions (Technical or Editorial)
Mark Kromis Program Chemist	Chris Barr Program Quality Manager	Rev 0 – Initial Issue (May 2012)

# Attachment 1

## Groundwater Sample Collection Record

Well ID: \_\_\_\_\_

### Groundwater Sample Collection Record

Client: _____	Date: _____	Time: Start _____ am/pm
Project No: _____		Finish _____ am/pm
Site Location: _____		
Weather Conds: _____	Collector(s): _____	

#### 1. WATER LEVEL DATA: (measured from Top of Casing)

a. Total Well Length \_\_\_\_\_ c. Length of Water Column \_\_\_\_\_ (a-b) Casing Diameter/Material \_\_\_\_\_

b. Water Table Depth \_\_\_\_\_ d. Calculated Well Volume (see back) \_\_\_\_\_

#### 2. WELL PURGEABLE DATA

a. Purge Method: \_\_\_\_\_

b. Acceptance Criteria defined (see SAP or Work Plan)

- Minimum Required Purge Volume (@ \_\_\_\_\_ well volumes) \_\_\_\_\_
- Maximum Allowable Turbidity \_\_\_\_\_ NTUs
- Stabilization of parameters \_\_\_\_\_ %

c. Field Testing Equipment used: Make \_\_\_\_\_ Model \_\_\_\_\_ Serial Number \_\_\_\_\_

Time (min)	Volume Removed (gal)	Temp. (°C)	pH s.u.	Spec. Cond. (µS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Drawdown (m)	Color/Odor/etc.

d. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has required turbidity been reached	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have parameters stabilized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If no or N/A - Explain below.

\_\_\_\_\_

(continued on back)

#### 3. SAMPLE COLLECTION:

Method: \_\_\_\_\_

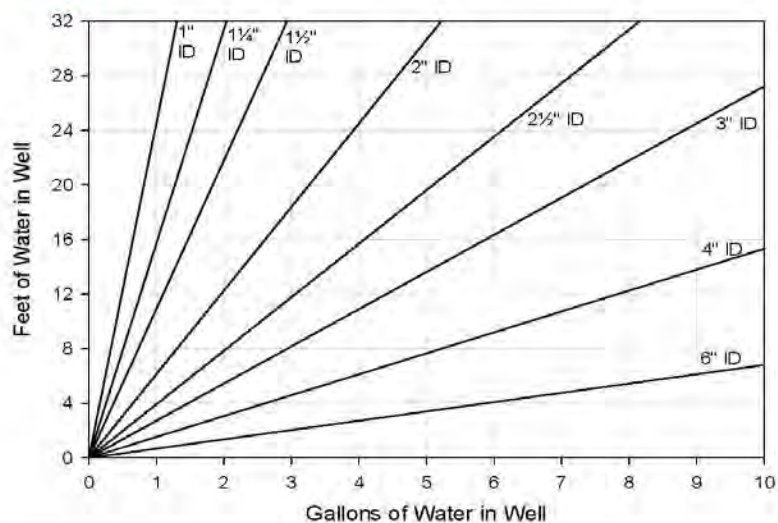
Sample ID	Container Type	No. of Containers	Preservation	Analysis Req.	Time

Comments \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

### Purge Volume Computation

Well ID:



Volume / Linear Ft. of Pipe		
ID (in)	Gallon	Liter
¼	0.0025	0.0097
⅜	0.0057	0.0217
½	0.0102	0.0386
¾	0.0229	0.0869
1	0.0408	0.1544
1¼	0.0637	0.2413
1½	0.0918	0.3475
2	0.1632	0.6178
2½	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

(continued from front)

[illegible]

Signature \_\_\_\_\_ Date \_\_\_\_\_

# Direct Push Sampling Techniques

## Procedure 3-17

### 1.0 Purpose and Scope

- 1.1 This standard operating procedure (SOP) provides guidance on the use of direct push techniques for the United States Army Corp of Engineers (USACE).
- 1.2 This procedure is the Program-approved professional guidance for work performed by AECOM for USACE.
- 1.3 This procedure shall serve as management-approved professional guidance for the Program and is consistent with protocol in the Uniform Federal Policy-Quality Assurance Project Plan (DoD 2005). As professional guidance for specific activities, this procedure is not intended to obviate the need for professional judgment during unforeseen circumstances. Deviations from this procedure while planning or executing planned activities must be approved by both the Project Manager and the Quality Assurance (QA) Manager or Technical Director, and documented.
- 1.4 If there are procedures whether it be from AECOM, state and/or federal that are not addressed in this SOP and are applicable to direct push sampling then those procedures may be added as an appendix to the project-specific SAP.

### 2.0 Safety

- 2.1 Field personnel shall perform work in accordance with the site-specific Accident Prevention Plan (APP) and Site-Safety and Health Plan (SSHP). During monitoring well installation, subcontractors in direct contact with potentially contaminated media shall wear the proper personal protective equipment (PPE) as outlined in the site-specific health and safety plan. Failure to comply will result in disciplinary action.
- 2.2 If circumstances warrant, a real-time immediate response instrument, such as a Miniram Dust Monitor, organic vapor analyzer, HNu, Thermo, Draeger or Sensidyne tubes, or explosimeter, should be used to monitor the work area. When real/time instrument response exceeds the permissible exposure limit, personnel shall don the appropriate PPE and alternate control measures to ensure personnel safety. If safe control measures are not achievable, field activities shall be discontinued immediately. Company-specific APP/SSHPs offer guidelines on air surveillance and on selection of PPE. In addition, the site-specific APP/SSHP includes an air monitoring program and suggested PPE.
- 2.3 In addition to the aforementioned precautions and depending upon the type of contaminant expected, employ the following safe work practices:
  - Particulate or Metal Compounds
    - 1. Avoid skin contact and/or incidental ingestion of soil.
    - 2. Wear protective clothing, steel-toed boots, gloves, safety glasses, and hearing protection as warranted.
  - VOCs
    - 1. Avoid breathing constituents venting from holes by approaching upwind, and/or by use of respiratory protection.
    - 2. Pre-survey the area with a flame ionization detector (FID) or photoionization detector (PID) prior to sampling.

3. If monitoring results indicate organic vapors that exceed action levels as specified in the site-specific APP/SSHP, sampling activities may need to be conducted in Level C protection. At a minimum, skin protection will be required by use of gloves and Tyvek or other media that is protective against the media being encountered.

#### Flammable or Explosive Conditions

1. Monitor explosive gases as continuously as possible using an explosimeter and oxygen meter.
2. Place all ignition sources upwind or crosswind of the borehole.
3. If explosive gases exceed the designated action levels as specified in the site-specific APP/SSHP, cease operations and evaluate conditions.

#### Physical Hazards Associated With Soil Sampling

1. To avoid possible back strain associated with sample collection, use the large muscles of the legs, not the back, when retrieving soil samplers.
2. Stay clear of all moving equipment, and avoid wearing loose fitting clothing.
3. To avoid slip/trip/fall hazards, be wary of open trenches, pits, or holes.
4. Be aware of restricted mobility due to PPE.
5. To avoid hand, wrist, arm, shoulder, and back trauma due to the use of slide hammers or hand augers, rotate sampling among field personnel

### 3.0 Terms and Definitions

- 3.1 Direct push techniques are methods for subsurface sampling or monitoring that involve the application of downward pressure (usually supplied through hydraulic means) without the benefit of cutting tool rotation to enter soil. A variety of systems are available under several trade names, such as GeoProbe®. Equipment may be skid-mounted, trailered, or mounted directly on the frame of a vehicle.

### 4.0 Interferences

- 4.1 Potential interferences could result from cross-contamination between samples or sample locations. Minimization of the cross contamination will occur through the following:
  - The use of clean sampling tools at each location as necessary.
  - Avoidance of material that is not representative of the media to be sampled.

### 5.0 Training and Qualifications

#### 5.1 Qualifications and Training

The individual executing these procedures must have read, and be familiar with, the requirements of this SOP.

#### 5.2 Responsibilities

- 5.2.1 The **Project Manager** is responsible for ensuring that these standard direct push technique procedures are followed during projects conducted under the Program and that a qualified individual conducts or supervises the projects. A qualified individual for subsurface sampling or monitoring using direct push techniques is defined as a person with a degree in geology, hydrogeology, or geotechnical/civil engineering with at least 1 year of experience supervising soil boring construction using conventional drilling or direct push techniques. The Project Manager or designee is responsible for ensuring that all personnel involved in direct push

sampling techniques shall have the appropriate education, experience, and training to perform their assigned tasks as specified in Chief of Naval Operations Instruction 5090.1c (DON 2007).

- 5.2.2 The Program Quality Manager is responsible for ensuring overall compliance with this procedure.
- 5.2.3 The Site Supervisor is responsible for ensuring that all field personnel follow these procedures.
- 5.2.4 All Field Personnel are responsible for the implementation of this procedure.
- 5.2.5 The Field Personnel and/or Field Manager is responsible for directly supervising the direct push sampling procedures to ensure that they are conducted according to this procedure, and for recording all pertinent data collected during sampling.

## 6.0 Equipment and Supplies

In addition to those materials provided by the subcontractor, the project **Field Manager/Field Personnel** will require:

- Boring Logs;
- Spoons or scoops;
- Sample kit (bottles, labels, custody records and tape, cooler, ice), if laboratory analysis is required;
- Sample collection pan;
- Folding rule or tape measure;
- Plastic sheeting;
- Utility knife;
- Equipment decontamination materials (as described in SOP 3-06, *Equipment Decontamination*);
- Health and safety equipment (as required by APP/SSHP); and
- Field project notebook/pen.

## 7.0 Procedure

Direct push techniques may be used as a cost-effective alternative to conventional drilling techniques for obtaining subsurface soil and groundwater samples and for monitoring subsurface conditions.

### 7.1 Method Selection

Base the decision to use direct push techniques on: (1) their ability to achieve the required information at the required level of quality control and (2) their cost-effectiveness compared to conventional drilling methods. Major limitations of direct push techniques are their inability to penetrate rock or cobbles and a shallow maximum depth of penetration. The capabilities of direct push systems vary significantly among vendors. Consider these differences in capabilities when evaluating the method for a subsurface exploration program.

Use direct push techniques to obtain groundwater samples for confirmatory analyses only if the screen placement method protects the screen from clogging during installation and allows the installation of a sand-pack around the exterior of the well screen.

### 7.2 Inspection of Equipment

Inspect direct push equipment prior to use for signs of fluid leakage, which could introduce contaminants to the soil. If, at any time during equipment operation, fluid is observed leaking from the rig, cease operations and immediately repair or contain the leak. Collect, containerize, and label soil and other materials affected by the leak for proper disposal (see SOP 3-05, *IDW Management*).



### 7.3 Preparation of Work Site

Inspect the work site prior to commencing operations to ensure that no overhead hazards exist that could impact the direct push equipment, and the work area should be cleared and/or marked by the local underground utility locating service (e.g., DigSafe). In addition, clear locations planned for subsurface exploration using either geophysical methods and/or hand excavate locations to a depth of 2 to 3 feet prior to soil penetration, unless it is certain (by virtue of subsurface clearing activities) that no utilities or other hazardous obstructions will be encountered in the first 2 to 3 feet. Hand excavation may be waived when it is not practical.

Locate the direct push rig so that it is downslope from the penetration point, if the work is to be performed on a grade. Locate the rig downwind or crosswind of the penetration point, if possible. Cover the area surrounding, and in the vicinity of, the penetration point with plastic. Establish required exclusion zones using plastic tape or cones to designate the various areas.

### 7.4 Equipment Decontamination

To avoid cross-contamination, thoroughly decontaminate equipment used for direct push exploration and sampling as described in SOP 3-06, *Equipment Decontamination*. Decontaminate sampling tools and downhole equipment between each sampling event and between penetration points. At a minimum, steam clean or wash and rinse the equipment. Collect, containerize, and label all wash and rinse water for proper disposal. Clean equipment (e.g., drive rods and samplers) shall not come into contact with contaminated soils or other contaminated materials. Keep equipment on plastic or protect it in another suitable fashion. Store push rods and other equipment removed from a hole on plastic sheeting until properly decontaminated.

### 7.5 Soil Sampling

This SOP assumes that the subcontractor will perform sampling; therefore, detailed procedures regarding sample acquisition are not provided. Vendors of direct push equipment offer a variety of sampling systems designed specifically for their equipment. Both continuous and discrete soil samples may be obtained using sampling equipment similar to that described in Procedure 3-21, *Surface and Subsurface Soil Sampling*. The preferred methods for soil sampling using direct push techniques use brass or stainless steel split-tube samplers that are driven through the horizon to be sampled. Use plastic sample tubes (e.g., Macro-Core Samplers) only for screening purposes or, in the case of confirmatory sampling, if samples will not be analyzed for volatile organic compounds (VOCs) or semivolatile organic compounds (SVOCs).

### 7.6 Groundwater Sampling

Direct push vendors offer numerous methods for obtaining groundwater samples. Key differences among methods involve: (1) the maximum well diameter achievable; (2) the ability to protect the well screen from exposure to contaminated overburden soils during installation; (3) the ability to install packing around the screen; (4) flexibility in the size, materials of construction, and design of well screens; and (5) the ability to convert sampling points into permanent monitoring wells. The limitations and abilities of a given system must be thoroughly understood and matched to the needs of the project before committing to the collection of groundwater samples using direct push techniques.

Use direct push techniques only to collect screening samples unless it is confirmed that the system:

1. Effectively protects the well screen from exposure to contaminated overburden soils during installation
2. Allows the installation of effective packing around the well screen
3. Allows the well screen to be effectively sealed against the downward infiltration of overlying groundwater or surface precipitation
4. Is constructed of materials compatible with the intended sampling and analysis goals of the project

5. Allows the use of a well screen properly sized and slotted for the needs of the project

Additional information on the collection of groundwater samples can be found in SOP 3-14 Monitoring Well Sampling.

It is the responsibility of the **Project Manager** to evaluate and determine the appropriateness of direct push systems prior to committing to their use on any project involving groundwater sampling. As part of this evaluation, it is recommended to obtain concurrence from regulatory authorities in advance for the method selection.

## 7.7 Borehole Abandonment

Methods for abandoning boreholes created with direct push systems will vary among vendors. Coordinate the desired method for abandonment with the vendor in the planning stages of the project to ensure proper abandonment.

Some direct push boreholes will close naturally as the drive rods and sampling tools are withdrawn. This may occur in loose, unconsolidated soils, such as sands. Close all boreholes using one of the procedures described in this procedure, unless natural caving precludes such closure.

The three methods for closing direct push boreholes are:

1. Add granulated or pelletized bentonite and hydrate in layers, proceeding from the bottom of the hole to the surface.
2. Pour premixed cement/water (or cement/water/bentonite) mixture into the hole.
3. Fill the entire hole with granular or pelletized bentonite and hydrate by means of a previously emplaced water tube that is gradually withdrawn as water is supplied to the bentonite.

The second method is recommended. For shallow holes less than 10 feet in depth, pour a cement/water/bentonite mix directly into the opening using a funnel. For deeper holes, use a conductor (tremie) pipe to carry the grout mix to the far reaches of the borehole. Lower the conductor pipe to within 2 inches of the bottom and gradually withdraw it as grout is added, keeping the lower end of the pipe submerged in grout at all times.

The recommended grout mixture for well abandonment is 7 to 9 gallons of water per 94-pound bag of Portland cement, with 3 percent to 5 percent by weight of powdered bentonite added to the mixture. Commercial products, such as Volcay are acceptable with pre-approval of the **Project Manager**.

Seal boreholes to within 0.5 to 2.0 feet of the surface. Inspect the abandoned borehole after 24 hours to ensure that grout shrinkage does not occur. If significant shrinkage has occurred, re-grout the borehole. Fill the remaining portion of the hole with local topsoil or appropriate paving materials.

## 8.0 Quality Control and Assurance

- 8.1 Collection of representative samples will be ensured through adherence to the procedures in this SOP and the sampling strategy outlined in the SAP. The field quality control samples identified in the SAP must be collected. These samples may include field duplicates, equipment rinsate blanks, trip blanks, and matrix spike/matrix spike duplicates

## 9.0 Records, Data Analysis, Calculations

- 9.1 Various forms are required to ensure that adequate documentation is made of the sample collection activities. These forms may include:
  - Boring logs;
  - Field logbook;



- Sample collection records;
- Chain-of-custody forms; and
- Shipping labels.

- 9.2 Boring logs (Attachment 1) will provide visual and descriptive information for samples collected at each soil boring and are often the most critical form of documentation generated during a soil sampling program.
- 9.3 The field logbook is kept as a general log of activities and should not be used in place of the boring log.
- 9.4 Chain-of-custody forms are transmitted with the samples to the laboratory for sample tracking purposes.
- 9.5 Shipping labels are required is sample coolers are to be transported to a laboratory by a third party (courier service).

## 10.0 Attachments or References

- 10.1 Attachment 1 – Boring Log
- 10.2 Department of Defense, United States (DoD). 2005. *Uniform Federal Policy for Quality Assurance Project Plans, Part 1: UFP-QAPP Manual*. Final Version 1. DoD: DTIC ADA 427785, EPA-505-B-04-900A. In conjunction with the U. S. Environmental Protection Agency and the Department of Energy. Washington: Intergovernmental Data Quality Task Force. March. On-line updates available at: [http://www.epa.gov/fedfac/pdf/ufp\\_qapp\\_v1\\_0305.pdf](http://www.epa.gov/fedfac/pdf/ufp_qapp_v1_0305.pdf).
- 10.3 SOP 3-05, *IDW Management*.
- 10.4 SOP 3-06, *Equipment Decontamination*.
- 10.5 SOP 3-21, *Surface and Subsurface Soil Sampling*.

Author	Reviewer	Revisions (Technical or Editorial)
Mark Kromis Program Chemist	Chris Barr Program Quality Manager	Rev 0 – Initial Issue (May 2012)

# Attachment 1

## Boring Log

<b>Boring ID:</b>							
Page <u>1</u> of <u>      </u>							
Project Name:		Drilling Company:		Type of Surface Material:			
Project Number:		Drilling Method:		Patching Material:			
Date Started Drilling:		Rig Type:		Drilling Water Level:			
Date Finished Drilling:		Core Size:		Boring Total Depth (bgs):			
Physical Location:				Logged By:			
(Note: bgs = below ground surface)							
Depth Range	Recovery ft/%	PID (ppm)	Moisture Content	GA Class.	USCS	GA Class: Garfield Avenue Sites classification & Modified Unified Soil Classification System	
						Ground Surface Cover and Thickness:	Sample name & #:
0-1							
1-2							
2-3							
3-4							
4-5							
5-6							
6-7							
7-8							
8-9							
9-10							
10-11							
11-12							
12-13							
13-14							
14-15							
15-16							
16-17							
17-18							
18-19							
19-20							
<b>Stratigraphic Unit Intervals:</b>						<b>Comments:</b>	
1.)		5.)					
2.)		6.)					
5.)		6.)					

# Operation and Calibration of a Photoionization Detector

## Procedure 3-20

### 1.0 Purpose and Scope

#### 1.1 Purpose and Applicability

- 1.1.1 This standard operating procedure (SOP) describes the procedures that will be followed by field staff for operation and calibration of a photoionization detector (PID). The PID is primarily used by AECOM personnel for safety and survey monitoring of ambient air, determining the presence of volatiles in soil and water, and detecting leakage of volatiles.
- 1.1.2 PIDs routinely used by field personnel include the Photovac Microtip, Thermoelectron 580EZ, and MiniRAE 2000. Personnel responsible for using the PID should first read and thoroughly familiarize themselves with the instrument instruction manual.

#### 1.2 Principle of Operation

- 1.2.1 The PID is a non-specific vapor/gas detector. The unit generally consists of a hand-held probe that houses a PID, consisting of an ultraviolet (UV) lamp, two electrodes, and a small fan which pulls ambient air into the probe inlet tube. The probe is connected to a readout/control box that consists of electronic control circuits, a readout display, and the system battery. Units are available with UV lamps having an energy from 9.5 electron volts (eV) to 11.7 eV.
- 1.2.2 The PID analyzer measures the concentration of trace gas present in the atmosphere by photoionization. Photoionization occurs when an atom or molecule absorbs a photon of sufficient energy to release an electron and become a positive ion. This will occur when the ionization potential of the molecule (in electron volts (eV)) is less than the energy of the photon. The source of photons is an ultraviolet lamp in the probe unit. Lamps are available with energies ranging from 9.5 eV to 11.7 eV. All organic and inorganic vapor/gas compounds having ionization potentials lower than the energy output of the UV lamp are ionized and the resulting potentiometric change is seen as a positive reading on the unit. The reading is proportional to the concentration of organics and/or inorganics in the vapor.
- 1.2.3 Sample gases enter the probe through the inlet tube and enter the ion chamber where they are exposed to the photons emanating from the UV lamp. Ionization occurs for those molecules having ionization potentials near to or less than that of the lamp. A positive- biased polarizing electrode causes these positive ions to travel to a collector electrode in the chamber. Thus the ions create an electrical current which is amplified and displayed on the meter. This current is proportional to the concentration of trace gas present in the ion chamber and to the sensitivity of that gas to photoionization.
- 1.2.4 In service, the analyzer is first calibrated with a gas of known composition equal to, close to, or representative of that to be measured. Gases with ionization potentials near to or less than the energy of the lamp will be ionized. These gases will thus be detected and measured by the analyzer. Gases with ionization potentials greater than the energy of the lamp will not be detected. The ionization potentials of the major components of air, i.e., oxygen, nitrogen, and carbon dioxide, range from about 12.0 eV to 15.6 eV and are not ionized by any of the lamps available. Gases with ionization potentials near to or slightly higher than the lamp are partially ionized, with low sensitivity.

#### 1.3 Specifications

- 1.3.1 Refer to the manufacturer's instructions for the technical specifications of the instrument being used. The operating concentration range is typically 0.1 to 2,000 ppm isobutylene equivalent.

## 2.0 Safety

- 2.1 The health and safety considerations for the work associated with this SOP, including both potential physical and chemical hazards, will be addressed in the project Accident Prevention Plan (APP) and Site Safety and Health Plan (SSHP). In the absence of a APP, work will be conducted according to the Work Plan (WP) and/or direction from the **Site Safety and Health Officer (SSHO)**.
- 2.2 Only PIDs stamped Division I Class I may be used in explosive atmospheres. Refer to the project APP/SSHP for instructions pertaining to instrument use in explosive atmospheres.

## 3.0 Terms and Definitions

None.

## 4.0 Interferences

- 4.1 Regardless of which gas is used for calibration, the instrument will respond to all analytes present in the sample that can be detected by the type of lamp used in the PID.
- 4.2 Moisture will generate a positive interference in the concentration measured for a PID and is characterized by a slow increase in the reading as the measurement is made. Care must be taken to minimize uptake of moisture to the extent possible. Refer to the manufacturers' instructions for care, cleaning, and maintenance.
- 4.3 Uptake of soil into the PID must be avoided as it will compromise instrument performance by blocking the probe, causing a positive interference, or dirtying the PID lamp. Refer to the manufacturers' instructions for care, cleaning, and maintenance.
- 4.4 The user should listen to the pitch of the sampling pump. Any changes in pitch may indicate a blockage and corrective action should be initiated.

## 5.0 Training and Qualifications

### 5.1 Qualifications and Training

The individual executing these procedures must have read, and be familiar with, the requirements of this SOP.

### 5.2 Responsibilities

- 5.2.1 The Project Manager is responsible for ensuring that the operation and calibration activities comply with this procedure. The Project Manager is responsible for ensuring that all personnel involved in the operation and calibration shall have the appropriate education, experience, and training to perform their assigned tasks.
- 5.2.2 The Program Quality Manager is responsible for ensuring overall compliance with this procedure.
- 5.2.3 The Site Supervisor is responsible for ensuring that all operation and calibration activities are conducted according to this procedure.
- 5.2.4 All Field Personnel are responsible for the implementation of this procedure.

## 6.0 Equipment and Supplies

- Calibration Gas: Compressed gas cylinder of isobutylene in air or similar stable gas mixture of known concentration. The selected gas should have an ionization potential similar to that of the vapors to be monitored, if known. The concentration should be at 50-75% of the range in which the instrument is to be calibrated;

- Regulator for calibration gas cylinder;
- Approximately 6 inches of Teflon® tubing;
- Tedlar bag (optional);
- Commercially-supplied zero grade air (optional);
- "Magic Marker" or "Sharpie" or other waterproof marker;
- Battery charger;
- Moisture traps;
- Spare lamps;
- Manufacturer's instructions; and
- Field data sheets or logbook/pen.

## 7.0 Procedure

### 7.1 Preliminary Steps

- 7.1.1 Preliminary steps (battery charging, check-out, calibration, maintenance) should be conducted in a controlled or non-hazardous environment.

### 7.2 Calibration

- 7.2.1 The PID must be calibrated in order to display concentrations in units equivalent to ppm. First a supply of zero air (ambient air or from a supplied source), containing no ionizable gases or vapors is used to set the zero point. A span gas, containing a known concentration of a photoionizable gas or vapor, is then used to set the sensitivity.
- 7.2.2 Calibrate the instrument according to the manufacturer's instructions. Record the instrument model and identification number, the initial and adjusted meter readings, the calibration gas composition and concentration, and the date and the time in the field records.
- 7.2.3 If the calibration cannot be achieved or if the span setting resulting from calibration is 0.0, then the lamp must be cleaned (Section 7.4).

### 7.3 Operation

- 7.3.1 Turn on the unit and allow it to warm up (minimum of 5 minutes). Check to see if the intake fan is functioning; if so, the probe will vibrate slightly and a distinct sound will be audible when holding the probe casing next to the ear. Also, verify on the readout display that the UV lamp is lit.
- 7.3.2 Calibrate the instrument as described in Section 7.2, following the manufacturer's instructions. Record the calibration information in the field records.
- 7.3.3 The instrument is now operational. Readings should be recorded in the field records.
- 7.3.4 When the PID is not being used or between monitoring intervals, the unit may be switched off to conserve battery power and UV lamp life; however, a "bump" test should be performed each time the unit is turned on and prior to taking additional measurements. To perform a bump test, connect the outlet tubing from a Tedlar bag containing a small amount of span gas to the inlet tubing on the unit and record the reading. If the reading is not within the tolerance specified in the project plan, the unit must be recalibrated.
- 7.3.5 At the end of each day, recheck the calibration. The check will follow the same procedures as the initial calibration (Section 7.2) except that no adjustment will be made to the instrument. Record the information in the field records.

- 7.3.6 Recharge the battery after each use (Section 7.4).
- 7.3.7 When transporting, ensure that the instrument is packed in its stored condition in order to prevent damage.
- 7.4 **Routine Maintenance**
- 7.4.1 Routine maintenance associated with the use of the PID includes charging the battery, cleaning the lamp window, replacing the detector UV lamp, replacing the inlet filter, and replacing the sample pump. Refer to the manufacturer's instructions for procedures and frequency.
- 7.4.2 All routine maintenance should be performed in a non-hazardous environment.
- 7.5 **Troubleshooting Tips**
- 7.5.1 One convenient method for periodically confirming instrument response is to hold the sensor probe next to the tip of a magic marker. A significant reading should readily be observed.
- 7.5.2 Air currents or drafts in the vicinity of the probe tip may cause fluctuations in readings.
- 7.5.3 A fogged or dirty lamp, due to operation in a humid or dusty environment, may cause erratic or fluctuating readings. The PID should never be operated without the moisture trap in place.
- 7.5.4 Moving the instrument from a cool or air-conditioned area to a warmer area may cause moisture to condense on the UV lamp and produce unstable readings.
- 7.5.5 A zero reading on the meter should not necessarily be interpreted as an absence of air contaminants. The detection capabilities of the PID are limited to those compounds that will be ionized by the particular probe used.
- 7.5.6 Many volatile compounds have a low odor threshold. A lack of meter response in the presence of odors does not necessarily indicate instrument failure.
- 7.5.7 When high vapor concentrations enter the ionization chamber in the PID the unit can become saturated or "flooded". Remove the unit to a fresh air environment to allow the vapors to be completely ionized and purged from the unit.

## 8.0 Quality Control and Assurance

- 8.1 The end use of the data will determine the quality assurance requirements that are necessary to produce data of acceptable quality. These quality assurance requirements will be defined in the site-specific workplan or Sampling and Analysis Plan (SAP), hereafter referred to as the project plan.
- 8.2 Calibration of the PID will be conducted at the frequency specified in the project plan. In the absence of project-specific guidance, calibration will be performed at the beginning of each day of sampling and will be checked at the end of the sampling day or whenever instrument operation is suspect. The PID will sample a calibration gas of known concentration. The instrument must agree with the calibration gas within  $\pm 10\%$ . If the instrument responds outside this tolerance, it must be recalibrated.
- 8.3 Checks of the instrument response (Section 7.5) should be conducted periodically and documented in the field records.

## 9.0 Records, Data Analysis, Calculations

Safety and survey monitoring with the PID will be documented in a bound field logbook, or on standardized forms, and retained in the project files. The following information is to be recorded:

- Project name and number;
- Instrument manufacturer, model, and identification number;

- Operator's signature;
- Date and time of operation;
- Calibration gas used;
- Calibration check at beginning and end of day (meter readings before adjustment);
- Span setting after calibration adjustment;
- Meter readings (monitoring data obtained);
- Instances of erratic or questionable meter readings and corrective actions taken; and
- Instrument checks and response verifications – e.g., battery check, magic marker response (Section 7.5) or similar test.

## 10.0 Attachments or References

United States Environmental Protection Agency. Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (EISOPQAM). USEPA, Region 4, SEDS, Enforcement and Investigations Branch, Athens, GA. November 2001.

Author	Reviewer	Revisions (Technical or Editorial)
Robert Shoemaker Senior Scientist	Chris Barr Program Quality Manager	Rev 0 – Initial Issue (May 2012)

# Surface and Subsurface Soil Sampling Procedures

## Procedure 3-21

### 1.0 Purpose and Scope

- 1.1 This standard operating procedure (SOP) describes the procedures for soil sampling. The procedure includes surface and subsurface sampling by various methods using hand auguring, test pit, direct-push, and split-spoon equipment.
- 1.2 The procedure includes soil sampling for volatile organic compounds (VOCs). For project specific information (e.g. sampling depths, equipment to be used, and frequency of sampling), refer to the Sampling and Analysis Plan (SAP), which takes precedence over these procedures. Surface soil sampling, typically considered to be up to two feet below ground surface by EPA standards, is typically accomplished using hand tools such as shovels or hand augers. Test pit samples are considered subsurface samples, although normally collected via hand tools similar to surface soil sampling or by excavation machinery. Direct-push and split-spoon sampling offer the benefit of collecting soil samples from a discrete or isolated subsurface interval, without the need of extracting excess material above the target depth. These methods dramatically reduce time and cost associated with disposal of material from soil cuttings when compared to test pit sampling. In addition, direct-push and split-spoon sampling methods can obtain samples at targeted intervals greater than 15 feet in depth, allowing for discrete depth soil sampling while speeding up the sampling process. Direct-push methods work best in medium to fine-grained cohesive materials such as medium to fine sands, silts, and silty clay soils. Split-spoon sampling works well in all types of soil, but is somewhat slower than direct-push methods. Samples are composited so that each sample contains a homogenized representative portion of the sample interval. Due to potential loss of analytes, samples for volatile analysis are not composited. Samples for chemical analysis can be collected by any of the above-mentioned sampling methods, as disturbed soil samples. Undisturbed samples are collected, sealed, and sent directly to the laboratory for analysis. For undisturbed samples, the samples are not homogenized.

### 2.0 Safety

- 2.1 The health and safety considerations for the work associated with this SOP, including both potential physical and chemical hazards, will be addressed in the project-specific Accident Prevention Plan (APP) and Site Safety and Health Plan (SSHP). In the absence of a APP/SSHP, work will be conducted according to the Work Plan (WP) and/or direction from the **Site Safety and Health Officer (SSHO)**.
- 2.2 Before soil sampling commences, appropriate entities (e.g. DigSafe, local public works departments, company facilities) must be contacted to assure the anticipated soil sampling locations are marked for utilities, including electrical, telecommunications, water, sewer, and gas.

### 3.0 Terms and Definitions

None.

### 4.0 Interferences

- 4.1 Low recovery of soil from sampling equipment will prevent an adequate representation of the soil profile and sufficient amount of soil sample. If low recovery is a problem, the hole may be offset and re-advanced, terminated, or continued using a larger diameter sampler.



- 4.2 Asphalt in soil samples can cause false positive results for hydrocarbons. To ensure samples are free of asphalt, do not collect samples that may contain asphalt. If the collection of samples potentially containing asphalt is unavoidable, note the sampling depths at which the presence of asphalt are suspected.
- 4.3 Instrumentation interferences addressed in SOPs for Calibration of the Photoionization Detector (PID), Headspace Screening for Total Volatile Organics, and Equipment Decontamination must also be considered.
- 4.4 Cross contamination from sampling equipment must be prevented by using sampling equipment constructed of stainless steel that is adequately decontaminated between samples.

## **5.0 Training and Qualifications**

### **5.1 Qualifications and Training**

The individual executing these procedures must have read, and be familiar with, the requirements of this SOP.

### **5.2 Responsibilities**

- 5.2.1 The Project Manager is responsible for ensuring that soil sampling activities comply with this procedure. The Project Manager is responsible for ensuring that all personnel involved in soil sampling shall have the appropriate education, experience, and training to perform their assigned tasks.
- 5.2.2 The Program Quality Manager is responsible for ensuring overall compliance with this procedure.
- 5.2.3 The Field Manager is responsible for ensuring that all soil sampling activities are conducted according to this procedure.
- 5.2.4 All Field Personnel are responsible for the implementation of this procedure.

## **6.0 Equipment and Supplies**

The depth at which samples will be collected and the anticipated method of sample collection (direct-push, split-spoon, hand auger, shovel, or test pits) will be presented in the SAP. The following details equipment typically needed for soil sampling, based on the various methods. See the SAP for specific detail of equipment and supply needs.

- 6.1 Depending on the nature of suspected contamination, field screening instrumentation may be used for direct sampling. Appropriate instrumentation and calibration standards should be available. If volatile organic contaminants are suspected and a PID will be used, refer to the equipment and instrumentation listed in SOP 3-20 Operation and Calibration of a Photoionization Detector. Equipment in this SOP includes but is not limited to:
- PID/FID;
  - Calibration gas; and
  - Tedlar® gas bags (for calibration).
- 6.2 If field screening methods include jar headspace screening for volatile organics, refer to the equipment and procedure in SOP 3-19 Headspace Screening for Total VOCs. Equipment in this SOP includes but is not limited to:
- Clean soil ("drillers jars") jars; and
  - Aluminium foil.

6.3 Appropriate decontamination procedures must be followed for sampling equipment. Refer to SOP 3-06 Equipment Decontamination. Equipment in this SOP includes but is not limited to:

- Phosphate-free detergent;
- Isopropyl Alcohol;
- Tap water;
- Deionized Ultra-Filtered (DIUF) Water;
- Plastic buckets or washbasins;
- Brushes; and
- Polyethylene sheeting.

6.4 The following general equipment is needed for all soil sampling, regardless of method:

- Stainless steel bowls;
- Stainless steel trowels;
- Appropriate sample containers for laboratory analysis;
- Personal Protective Equipment (PPE);
- Logbook;
- Cooler and ice for preservation; and
- Stakes and flagging to document sampling location.

6.5 The following additional equipment is needed for volatile organic sampling:

- Electronic pan scale and weights for calibration; and
- Syringes or other discrete soil core samplers.

6.6 The following additional equipment may be needed for surface and test pit soil sampling:

- Hand Auger

6.7 The following additional equipment may be needed for soil sampling from direct push and/or split-spoon equipment:

- Tape measure or folding carpenter's rule for recording the length of soil recovered.

Note: All subsurface drilling equipment will be provided and maintained by the subcontractor.

## **7.0 Procedure**

### **7.1 General Soil Sampling Procedure for All Soil Sampling Methods**

7.1.1 Record the weather conditions and other relevant on-site conditions.

7.1.2 Select the soil sampling location, clear vegetation if necessary, and record the sampling location identification number and pertinent location details.

7.1.3 Verify that the sampling equipment is properly decontaminated, in working order, and situated at the intended sampling location.

- 7.1.4 Place polyethylene sheeting on the ground and assemble all necessary sampling equipment on top of it. Cover surfaces onto which soils or sampling equipment will be placed (i.e. tables with polyethylene sheeting).
- 7.1.5 Follow the appropriate procedures listed below for either surface, split-spoon, direct push, or test pit sample collection (7.2, 7.3, 7.4, and 7.5 respectively).
- 7.1.6 Collect soil samples according to procedures listed in Section 7.6 depending on project specific analyses.
- 7.1.7 Record date/time, sample ID, and sample descriptions in the field logbook or field form. A sketch or description of the location may also be recorded so the sample location can be re-constructed, especially if the location will not be recorded using global positioning satellite (GPS) equipment.
- 7.1.8 Immediately label the sample containers and place them on ice, if required for preservation. Complete the chain-of-custody form(s) as soon as possible.
- 7.1.9 Dispose of all excess excavated soil in accordance with the SAP.
- 7.1.10 If required, mark the sample location with a clearly labelled wooden stake or pin flag. If the location is on a paved surface, the location may be marked with spray paint.
- 7.1.11 Decontaminate the sampling equipment according to SOP 3-06 Equipment Decontamination.

## 7.2 **Surface Sampling**

- 7.2.1 The criteria used for selecting surface soil locations for sampling may include the following:
  - Visual observations (soil staining, fill materials);
  - Other relevant soil characteristics;
  - Site features;
  - Screening results;
  - Predetermined sampling approach (i.e. grid or random); and
  - Sampling objectives as provided in the SAP.
- 7.2.2 The following procedures are to be used to collect surface soil samples. Surface soils are considered to be soils that are up to two feet below ground surface, though state regulations and project objectives may define surface soils differently; therefore, the SAP should be consulted for direction on the depth from which to collect the surface soil samples. Sampling and other pertinent data and information will be recorded in the field logbook and/or on field forms. Photographs may be taken as needed or as specified in the SAP.
  1. Gently scrape any vegetative covering until soil is exposed. Completely remove any pavement.
  2. Remove soil from the exposed sampling area with a trowel, hand auger, or shovel. Put soils within the sampling interval in a stainless steel bowl for homogenizing. Monitor the breathing zone and sampling area as required in the HASP.
  3. For VOC analyses, collect representative soil samples directly from the recently-exposed soil using a syringe or other soil coring device (e.g., TerraCore®, EnCore®). Follow procedures in Section 7.6.1 for VOC sampling.
  4. Collect sufficient soil to fill all remaining sample jars into a stainless steel bowl. Homogenize the soil samples to obtain a uniform soil composition which is representative of the total soil sample collected according to the following procedure:
    - a) Remove all rocks and non-soil objects using a stainless steel spoon or scoop.

- b) Form a cone shaped mound with the sample material, then flatten the cone and split the sample into quarters.
- c) Use the stainless steel spoon/scoop to mix the quarter samples that are opposite.
- d) After mixing the opposite quarters, reform the cone shaped mound.
- e) Repeat this procedure a minimum of five (5) times, removing any non-soil objects and breaking apart any clumps.

### 7.3 Split-Spoon Sampling

- 7.3.1 At each boring location, the frequency and depth of split-spoon samples will be determined from the SAP. Split-spoon samples may be collected continuously, intermittently, or from predetermined depths.
- 7.3.2 Split-spoon samplers shall be driven into undisturbed soil by driving the spoon ahead of the drill augers/casing. In cohesive soils, or soils where the borehole remains open (does not collapse), two split-spoon samples may be taken prior to advancing the augers/casing.
- 7.3.3 After split-spoons are retrieved, open the split-spoon and measure the recovery of soil. If a PID will be used for screening, immediately scan the recovered sample for VOCs using the PID. Scan the recovered soil boring by making a hole in the soil with a decontaminated trowel and placing the PID inlet very close to the hole. Be very careful not to get soil on the tip of the PID. Take PID readings every 6 inches along the split-spoon and/or in any areas of stained or disturbed soil. Record the highest PID reading and the depth at which it was observed along with all other pertinent observations. If required in the SAP, VOC and headspace samples should be collected (see Section 7.6.1) prior to logging the sample.
- 7.3.4 If headspace screening for VOCs is required in the SAP, collect a soil sample (as defined in the SAP) and perform headspace screening according to SOP 3-19 Headspace Screening for Total VOCs.
- 7.3.5 Soils collected using the split-spoon sampler will be logged by the field representative using the procedure required in the SAP.
- 7.3.6 Collect the remainder of the sample volume required into a stainless steel bowl. Homogenize the soil so the material is uniform in composition and representative of the total soil sample collected. Follow homogenizing techniques as described in Section 7.2.
- 7.3.7 The SAP may specify that intervals to be sent to the laboratory be determined by visual observation and/or highest PID screening or headspace results, which can only be determined once the boring is complete. In this instance, a VOC sample should be collected at each interval. The remainder of the soil from that interval will be set aside in a clearly labelled stainless steel bowl covered with aluminium foil. Once the boring has been completed and the sample interval has been determined, the remainder of the soil can be homogenized according to Section 7.2 and submitted for laboratory analysis.
- 7.3.8 Once a boring is complete and all required samples have been collected, the boring must be completed as specified in the SAP (e.g., completed as a monitoring well, backfilled with bentonite, etc).

### 7.4 Direct Push Sampling

At each boring location, the frequency of direct-push samples will be determined from the SAP. Typically, samples with direct-push equipment are collected in 4 foot (ft) intervals, but smaller (e.g., 2 ft) and larger (e.g., 5 ft) intervals are also possible.

- 1. Sample using Macro-Core samplers with acetate liners to obtain discrete soil samples at the depths specified in the SAP.
- 2. Cut open the acetate liner. If required in the SAP, immediately scan the recovered soil boring for VOCs using a PID by making a hole in the soil with a decontaminated trowel and placing the PID inlet very close to the hole. Be very careful not to get soil on the tip of the PID. Take PID readings every 6 inches along the split-spoon and/or in any areas of stained or disturbed soil. Record the

highest PID reading and the depth at which it was observed along with all other pertinent observations. VOC and headspace samples, if required in the SAP should be collected (see Section 7.6.1) prior to logging the sample.

3. If required in the SAP, collect a soil sample (as defined in the SAP) and perform headspace screening according to SOP 3-19 Headspace Screening for Total VOCs.
4. Soils collected using the direct-push sampler will be logged by the by the field representative using the procedure required in the SAP.
5. Collect the remainder of the sample into a stainless steel bowl. Homogenize the soil collected so that the material is uniform in composition and representative of the total soil sample collected. Follow homogenizing techniques as described in Section 7.2.
6. Once a boring is complete and all required samples have been collected, the boring must be completed as specified in the SAP (e.g., completed as a monitoring well, backfilled with bentonite, etc).

## 7.5 Test Pit Sampling

7.5.1 Excavate the test pit to the desired depth.

7.5.2 Using the excavator bucket, collect soil samples as specified in the SAP. Collect a sample and perform screening analyses as required by the SAP. If VOCs contamination is suspected, perform headspace screening according to SOP 3-19 Headspace Screening for Total VOCs.

7.5.3 Collect the sample from center of the bucket to avoid potential contamination from the bucket.

7.5.4 VOC samples should also be collected from an undisturbed section soil in the excavator bucket. The top layer of exposed soil should be scraped away just prior to collecting the VOC samples.

7.5.5 Collect the remainder of the sample volume required into a stainless steel bowl. Homogenize the soil so the material is uniform in composition and representative of the total soil sample collected. Follow homogenizing techniques as described in Section 7.2.

7.5.6 Dispose of all excavated soil according to the SAP.

## 7.6 Sample Collection Methods

### 7.6.1 Volatile Organics Sampling

For soils collected for analyses of volatile organics, including Volatile Petroleum Hydrocarbons (VPH) or other purgable compounds, a closed system is maintained. From collection through analysis, the sample bottles are not opened. The bottle kit for a routine field sample for these analyses will typically include three 40-mL VOA vials and one soil jar. Two 40-mL VOA vials will contain either 5 mL reagent water or 5 mL sodium bisulfate and magnetic stir bars (i.e., low level vials). The third VOA vial will contain 15 mL methanol with no magnetic stir bar (i.e., high level vial). These vials are usually provided by the laboratory and are pre-weighed, with the tare weight recorded on the affixed sample label. No additional sample labels are affixed to the VOA vials, as addition of a label would alter the vial weight. All information is recorded directly on the sample label using an indelible marker. The soil jar is provided for percent solids determination. For VOC or VPH analyses, samples are collected prior to sample homogenization. Collect the VOC sample in accordance with the procedure described below.

1. Determine the soil volume necessary for the required sample weight, typically 5 grams:
  - a) Prepare a 5 mL sampling corer (e.g., Terra Core®) or cut-off plastic syringe.
  - b) Tare the sampler by placing it on the scale, and zeroing the scale.
  - c) Draw back the plunger to the 5 gram mark or 5mL (5cc) mark on cut-off syringe, and insert the open end of the sampler into an undisturbed area of soil with a twisting motion, filling the

sampler with soil. Note the location of the plunger with respect to the milliliter (cc) or other graduation printed on the sampler.

- d) Weigh the filled sampler, and remove or add soil until the desired weight is obtained. Note the location of the plunger which corresponds to this weight. Do not use this sample for laboratory analysis.
2. Once the required soil volume has been determined, pull the plunger back to this mark and hold it there while filling the syringe for each sample.
3. Collect 5 grams of soil using the cut-off syringe or Terra Core® sample device. Extrude the 5-grams of soil into one of the low level 40-mL VOA vials. Quickly wipe any soil from the threads of the VOA vial with a clean Kimwipe® and immediately close the vial. It is imperative that the threads be free from soil or other debris prior to replacing the cap on the vial in order to maintain the closed system necessary for the analysis.
4. Gently swirl the vial so that all of the soil is fully wetted with the preservative.
5. Fill the other low level 40 mL VOA vial in this manner.
6. Repeat the process for the high level VOA vials, only for the high level VOA vial three 5 gram aliquots (i.e., 15 grams total) should be extruded into the high level VOA vial.  
  
NOTE: Depending on the laboratory, some high level VOA vials only contain 5 mL or 10 mL of methanol. If this is the case, either 5 grams total or 10 grams total, respectively, should be extruded into the high level VOA vial. In other words, the mass of soil in grams should be identical to the volume of methanol in mL (i.e., 1:1 ratio of soil to methanol).
7. Collect any additional QC sample collected (e.g., field duplicate, MS, and MSD) in the same manner as above.
8. Fill the 4-oz glass jar with soil from the same area for percent moisture determination.

#### 7.6.2 Soil Sampling Method (All other analyses except VOC/VPH)

When all the required soil for a sampling location has been obtained, the soil can be homogenized as described in section 7.2. Collect sufficient volume to fill all of the remaining sample containers at least  $\frac{3}{4}$  full for all other analyses. Homogenize the soil in a decontaminated stainless steel bowl, removing rocks, sticks, or other non-soil objects and breaking apart any lumps of soil prior to filling the remaining sample containers.

NOTE: Soil samples must contain greater than 30% solids for the data to be considered valid.

## 8.0 Quality Control and Assurance

- 8.1 Sampling personnel should follow specific quality assurance guidelines as outlined in the SAP. Proper quality assurance requirements should be provided which will allow for collection of representative samples from representative sampling points. Quality assurance requirements outlined in the SAP typically suggest the collection of a sufficient quantity of field duplicate, field blank, and other samples.
- 8.2 Quality control requirements are dependent on project-specific sampling objectives. The SAP will provide requirements for equipment decontamination (frequency and materials), sample preservation and holding times, sample container types, sample packaging and shipment, as well as requirements for the collection of various quality assurance samples such as trip blanks, field blanks, equipment blanks, and field duplicate samples.

## 9.0 Records, Data Analysis, Calculations

All data and information (e.g., sample collection method used) must be documented on field data sheets, boring logs, or within site logbooks with permanent ink. Data recorded may include the following:

- Weather conditions;
- Arrival and departure time of persons on site;
- Instrument type, lamp (PID), make, model and serial number;
- Calibration gas used;
- Date, time and results of instrument calibration and calibration checks;
- Sampling date and time;
- Sampling location;
- Samples collected;
- Sampling depth and soil type;
- Deviations from the procedure as written; and
- Readings obtained.

## 10.0 Attachments or References

SOP 3-06, Equipment Decontamination

SOP 3-19, Headspace Screening for Total VOCs

SOP 3-20, Operation and Calibration of a Photoionization Detector

Author	Reviewer	Revisions (Technical or Editorial)
Robert Shoemaker Senior Scientist	Chris Barr Program Quality Manager	Rev 0 – Initial Issue (May 2012)

# Sediment Sampling

## Procedure 3-22

### 1.0 Purpose and Scope

1.1 Sediment contamination is a widespread environmental problem that can pose a threat to a variety of aquatic ecosystems. Sediment functions as a reservoir for common contaminants such as pesticides, herbicides, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), and metals such as lead, mercury, and arsenic. Contaminated sediments represent a hazard to aquatic life through direct toxicity, as well as to aquatic life, wildlife, and human health through bioaccumulation. Accurate assessment of environmental hazards posed by sediment contamination depends in large part on the accuracy and representativeness of sediment collection and analyses (U.S. EPA, 2001).

1.2 Selection and proper use of sediment sampling equipment is essential to the collection of accurate, representative sediment data that will meet the project Data Quality Objectives (DQOs). Most sediment collection devices are designed to isolate and consistently retrieve a specified volume and surface area of sediment, from a required depth below the sediment surface, with minimal disruption of the integrity of the sample and no contamination of the sample. Maintaining the integrity of the collected sediment, for the purposes of the measurements intended, is a primary concern in most studies because disruption of the sediment's structure could change its physiochemical and biological characteristics, thereby influencing the bioavailability of contaminants and the potential toxicity of the sediment (U.S. EPA, 2001).

When selecting the type of sediment sampling equipment to be used for an event, the project DQOs as well as the sediment characteristics should be considered. Related to the project DQOs is the desired depth of sediment sampling. For monitoring and assessment studies where historical contamination is not the focus, the upper 10 to 15 centimeters (cm) is typically the horizon of interest, as this is the horizon that generally contains the most recently deposited sediments and most epifaunal and infaunal organisms (U.S. EPA, 2001). The 0-6 inches interval for sediments with less than two feet of water is also used for human health risk assessment purposes. Sampling of these horizons can usually be done with grab samplers. However, if sediment contamination is being related to organism exposures (e.g. benthic macroinvertebrates and/or fish), or if characterization of deeper sediments is important for comparison of recent surficial versus historical contamination, then more precise sampling of sediment depths might be needed, and a hand corer may be more suitable (U.S. EPA, 2001).

1.3 This standard operating procedure (SOP) describes the procedure for the collection of sediment samples using the Petite Ponar<sup>®</sup> Grab Sampler, Ekman Bottom Grab Sampler, and Wildco<sup>®</sup> Hand Corer (or similar sampling devices). The applicability of each of the sediment samplers is described below.

The Petite Ponar<sup>®</sup> Grab Sampler is used to collect sediment samples in:

- Firm, hard bottoms such as sand, gravel, consolidated marl, and clay
- Mixtures of sand, stones, and coarse debris
- Soft or mucky sediments

The Ekman Bottom Grab Sampler is used to collect sediment samples in:

- Soft, finely divided littoral bottoms free from vegetation and intermixtures of sand, stones, and other coarse debris
- Bottoms composed of finely divided mulch, mud, muck, or submerged fine peaty materials



The Wildco® Hand Corer is used:

- To collect sediment samples for geological characterizations and dating
- To collect sediment samples for programs where it is important to maintain an oxygen-free environment for the sample during collection
- To collect sediment samples from a deeper depth than a grab sampler, and to characterize the depth of contamination at a site
- To investigate the historical input of contaminants to aquatic systems
- To collect sediment samples in semi-consolidated and soft sediment

Pictures and exploded diagrams of the Petite Ponar Grab Sampler, Ekman Bottom Grab Sampler, and Wildco® Hand Corer are presented in Figures 1, 2, and 3, respectively.

- 1.4 This procedure is the Program-approved professional guidance for work performed by Resolution Consultants under the Comprehensive Long-Term Environmental Action Navy (CLEAN) contract (Contract Number N62470-11-D-8013).
- 1.5 As guidance for specific activities, this procedure does not obviate the need for professional judgment. Deviations from this procedure while planning or executing planned activities must be approved in accordance with Program requirements for technical planning and review.

## 2.0 Safety

- 2.1 Depending upon the site-specific contaminants, various protective programs must be implemented prior to sampling the first location. All **field sampling personnel** responsible for sampling activities must review the project-specific health and safety plan (HASP) paying particular attention to the control measures planned for the sampling tasks. Conduct preliminary area monitoring of sample locations to determine the potential hazard to field sampling personnel. If significant contamination is observed, minimize contact with potential contaminants in both the vapor phase and solid or liquid matrix through the use of respirators and disposable clothing.
- 2.2 Observe standard health and safety practices according to the project-specific HASP. Suggested minimum protection during sediment sampling activities includes inner disposable vinyl gloves, outer chemical-protective nitrile gloves, and waders (if applicable). Refer to the project-specific HASP for the required PPE.
- 2.3 Handle all sediments removed from potentially contaminated locations in accordance with the IDW handling procedures in SOP 3-05, IDW Management.
- 2.4 Depending upon the type of contaminant expected or determined in previous sampling efforts, employ the following safe work practices:
- If sampling from a boat, all sampling personnel should wear personal flotation devices (PFDs) when in the boat, and should follow all health and safety protocols for working in a boat presented in the project-specific HASP.
  - Lifting the samplers into the boat, dumping its contents, and washing those contents may require leaning over the side of the boat. Care should be taken to keep the boat in proper balance at all times during sampling.
  - Severe injury to fingers or hands can be caused by movement of the lever arms of the Petite Ponar® Grab Sampler. Do not handle or move the Petite Ponar® Grab Sampler unless the safety pin is fully inserted in the locking holes.
  - Severe injury to fingers or hands can be caused by the closing of the sharpened scoops of the Ekman Bottom Grab Sampler. Handle the Ekman Bottom Grab Sampler very carefully when the springs are set and the cable loops are hooked (armed) on the Twin-Pin™ pins on the release mechanism. Do not “arm” the Ekman Bottom Grab Sampler until the sampler is ready

to be used. The Ekman Bottom Grab Sampler spring-loaded jaws are potentially dangerous; extreme care must be exercised when setting the jaws. To prevent injury (and to extend the life of the springs), unhook both springs from their scoop buttons after each sampling session.

### 3.0 Terms and Definitions

None.

### 4.0 Training and Qualifications

- 4.1 The **Contract Task Order (CTO) Manager** is responsible for ensuring that sediment sampling activities comply with this procedure. The **CTO Manager** is responsible for ensuring that all field sampling personnel involved in sediment sampling shall have the appropriate education, experience, and training to perform their assigned tasks.
- 4.2 The **Program Quality Manager** is responsible for ensuring overall compliance with this procedure.
- 4.3 The **Field Manager** is responsible for ensuring that all field sampling personnel follow these procedures.
- 4.4 **Field sampling personnel** are responsible for the implementation of this procedure.
- 4.5 The field sampler and/or task manager is responsible for directly supervising the sediment sampling procedures to ensure that they are conducted according to this procedure, and for recording all pertinent data collected during sampling.

### 5.0 Equipment and Supplies

- 5.1 For sediment sampling using all types of equipment, the following supplies are required:
  - Stainless steel bowls
  - Stainless steel hand trowels, spoons, spatulas, and scoops
  - Munsell Color Chart
  - Particle size chart
- 5.2 Petite Ponar<sup>®</sup> Grab Sampler
  - 3/16" braided polyester line
  - Auxiliary weights
- 5.3 Ekman Bottom Grab Sampler
  - 11 oz split messenger
  - 3/16" braided polyester line
  - Extension Handle
  - Auxiliary weights
- 5.4 Wildco<sup>®</sup> Hand Corer
  - 3/16" braided polyester line
  - Extension handle
  - Stainless steel core catchers (for normal sediments)
  - Eggshell<sup>™</sup> core catchers (for wet sediments)
  - Stainless steel nose piece
  - Cellulose acetate butyrate (CAB) liners
  - Core liner end caps
  - Core liner cutter
  - Geologists table

- Auxiliary weights

## 6.0 Procedure

6.1 Depending on the characteristics of the site being investigated, sediment samples may be collected from a boat, or by sampling personnel in waders. In all instances, sediment sampling should begin from the most downstream location and proceed to the most upstream location. If sediment samples are collocated with surface water samples, the surface water sample should be collected prior to the sediment sample in order to avoid increased turbidity from displaced sediment. Regardless of the type of sediment sampling equipment used, documentation of field observations and collection activities should be recorded on the sediment sampling sheet or electronic data collection device. The following observations should be recorded on the sediment sampling form (see Attachment 1) for all sediment sampling activities:

- Sample location
- Weather conditions and other relevant site conditions
- Depth of water to the nearest 0.1 foot. A surveyor rod may be used. If the surveyor rod is used, minimize water turbulence and do not disturb any sediment.
- Physical characteristics of the water body such as estimated current speed (stagnant, slow, medium, or fast) and direction, odor, color, presence of any dead vegetation, surface sheens, etc.
- Sediment color according to the Munsell Color Chart
- Sediment grain size according to a particle size chart

Specific procedures for the collection of sediment samples using the Petite Ponar<sup>®</sup> Grab Sampler, Ekman Bottom Grab Sampler, and Wildco<sup>®</sup> Hand Corer are presented below.

### 6.2 Petite Ponar<sup>®</sup> Grab Sampler

- 6.2.1 Inspect the sampler to ensure all parts are in good working condition.
- 6.2.2 Decontaminate the sampler according to the procedures in SOP 3-06, Equipment Decontamination.
- 6.2.3 Attach the 3/16" braided polyester line to the sampler by looping the line through the clevis at the top center of the lever arms and tying securely. Tie the other end of the line to the boat (if applicable), or make sure to hold on to the other end of the line. Strong, tight knots (e.g. bowline, two half hitches) are essential for operator safety and to prevent losing the sampler. If necessary, attach the auxiliary weights to the sampler according to the manufacturer's directions.
- 6.2.4 Insert the Pinch-Pin<sup>™</sup> into its hole in the lever arms, making sure to firmly push the Pinch-Pin<sup>™</sup> into the hole. As long as the line is taught, the Pinch-Pin<sup>™</sup> will stay in its place. When the line becomes the least bit slack (e.g. when the sampler hits the bottom), the Pinch-Pin<sup>™</sup> spring will force the Pinch-Pin<sup>™</sup> out of its hole, allowing the scoops to close.
- 6.2.5 Just before lowering the grab into the water, and with the line taught, remove the safety pin so the closing mechanism will release when the sampler is on the bottom. Make sure to keep the line taught, as any loss of tension in the line will cause the Pinch-Pin<sup>™</sup> to pop out, closing the sampler.
- 6.2.6 Lower the sampler into the water in a slow and controlled fashion, especially during the final 1-2', such that the bow wave is minimized, thus minimizing the dispersal of fine material on the sediment surface. At no time should the sampler be allowed to "free fall" down through the water column.

- 6.2.7 Once the sampler has reached the bottom, release the tension on the line, and allow the sampler to sink into the sediment momentarily. The release of tension on the line will cause the Pinch-Pin™ to pop out.
- 6.2.8 Collect the sample by pulling on the line, which will cause the lever arms to drive the scoops into the sediment in a closing motion. Keep pulling on the line in a controlled fashion until the scoops drive through the sediment and close.
- 6.2.9 Once the sampler scoops have closed, continue pulling on the line in a controlled fashion in order to retrieve the sampler back to the surface. When the sampler reaches the surface, lift it clear and bring it above a decontaminated stainless steel bowl. Inspect the sampler to ensure that an acceptable sample has been collected (See Figure 4). If the sample is not acceptable, discard the sample in an area that is not proximal or upstream to the area or subsequent areas that are being sampled.
- 6.2.10 Prior to sampling and sample homogenization, the overlying water in the sampler should be siphoned off, and not decanted (U.S. EPA 2001).
- 6.2.11 If acid volatile sulfide/simultaneously extracted metals (AVS/SEM) samples are to be collected, open the top screens of the sampler and collect the AVS/SEM sample directly from the sediment contained in the sampler according to the procedures specified in the project-specific SAP.
- 6.2.12 If volatile organic compound (VOC) samples are to be collected, open the top screens of the sampler and collect the VOC samples by inserting a syringe, Terra Core sampler, or other VOC sampling device directly into the undisturbed sediment contained within the sampler, making sure to follow all VOC sampling procedures specified in the project-specific SAP. Once the VOC samples have been collected, collect an additional aliquot for the VOC percent solids sample directly from the undisturbed sediment contained within the sampler.
- 6.2.13 Once the AVS/SEM and VOC samples have been collected (or if AVS/SEM and VOC samples are not required), open the sampler by pulling the two scoops open, taking care to keep hands and fingers away from the sharpened edges of the scoops, and allow the sediment to exit the sampler into the decontaminated stainless steel bowl.
- 6.2.14 If additional aliquots are necessary to provide adequate sample volume, repeat steps 6.2.3 through 6.2.12 until an adequate sample volume has been collected, taking care to deploy the sampler to an area that is proximal and upstream, but not on top of, the previous sample location.
- 6.2.15 Once an adequate sample volume has been collected, homogenize the sample in the stainless steel bowl, record the sediment sample information on the Sediment Sample Collection Form (see Attachment 1), and collect the sediment samples according to the procedures specified in the project-specific SAP (typically in order of decreasing volatility).
- 6.3 Ekman Bottom Grab Sampler with the 11 oz Split Messenger
  - 6.3.1 Inspect the sampler to ensure all parts are in good working condition.
  - 6.3.2 Decontaminate the sampler according to the procedures in SOP 3-06, Equipment Decontamination.
  - 6.3.3 Attach the 3/16" braided polyester line to the sampler by passing the line through the trip mechanism and knotting it securely below the underlying plate. Thread the 11 oz split messenger on the line, and tie the other end of the line to the boat (if applicable), or make sure to hold on to the other end of the line. Strong, tight knots (e.g. bowline, two half hitches) are essential to prevent losing the sampler. If necessary, attach the auxiliary weights to the sampler according to the manufacturer's directions.

- 6.3.4 Set the spring on the side of the sampler by hooking the end of the spring onto one scoop button and stretching the spring to reach the second scoop button. Repeat this procedure with the spring on the other side of the sampler.
- 6.3.5 Arm the scoops by hooking one cable loop to one Twin-Pin™ pin in the trip assembly on the top of the sampler. The white ball on the cable can be used as a hand grip to assist getting the cable loop hooked onto the Twin-Pin™ pin. Repeat for the opposite cable loop. The sampler is now armed and dangerous. Do not allow anything to come in contact with the trip assembly at the top of the sampler, as this may cause a sudden and unexpected closure of the sampler.
- 6.3.6 Lower the sampler into the water in a slow and controlled fashion, especially during the final 1-2', such that the bow wave is minimized, thus minimizing the dispersal of fine material on the sediment surface. At no time should the sampler be allowed to "free fall" down through the water column.
- 6.3.7 Once the sampler has reached the bottom, allow the sampler to settle momentarily. Once the sampler has settled, hold the line with just enough tension to keep it straight, and send the 11 oz split messenger down the line. Once the 11 oz split messenger impacts Twin-Pin™ strike pad in the trip assembly on the top of the sampler, the two cable loops will be released from the Twin-Pin™ pins, and the spring-loaded scoops of the sampler will automatically close.
- 6.3.8 Retrieve the sampler by pulling up the line in with a moderate, steady speed. When the sampler reaches the surface, lift it clear and bring it above a decontaminated stainless steel bowl. Inspect the sampler to ensure that an acceptable sample has been collected (See Figure 4). If the sample is not acceptable, discard the sample in an area that is not proximal or upstream to the area or subsequent areas that are being sampled.
- 6.3.9 Prior to sampling and sample homogenization, the overlying water in the sampler should be siphoned off, and not decanted (U.S. EPA 2001).
- 6.3.10 If AVS/SEM samples are to be collected, open the top lids of the sampler and collect the AVS/SEM sample directly from the sediment contained in the sampler according to the procedures specified in the project-specific SAP.
- 6.3.11 If VOC samples are to be collected, open the top lids of the sampler and collect the VOC samples by inserting a syringe, Terra Core sampler, or other VOC sampling device directly into the undisturbed sediment contained within the sampler, making sure to follow all VOC sampling procedures specified in the project-specific SAP. Once the VOC samples have been collected, collect an additional aliquot for the VOC percent solids sample directly from the undisturbed sediment contained within the sampler.
- 6.3.12 Once the AVS/SEM and VOC samples have been collected (or if AVS/SEM and VOC samples are not required), open the sampler by pulling on the white balls on both cables, opening the spring-loaded scoops and allowing the sediment to exit the sampler into the decontaminated stainless steel bowl. While the spring-loaded scoops are being held open, do not place hands or fingers inside or underneath the sampler.
- 6.3.13 If additional aliquots are necessary to provide adequate sample volume, repeat steps 6.3.4 through 6.3.11 until an adequate sample volume has been collected, taking care to deploy the sampler to an area that is proximal and upstream, but not on top of, the previous sample location.
- 6.3.14 Once an adequate sample volume has been collected, homogenize the sample in the stainless steel bowl, record the sediment sample information on the Sediment Sample Collection Form (see Attachment 1), and collect the sediment samples according to the procedures specified in the project-specific SAP (typically in order of decreasing volatility).

#### 6.4 Ekman Bottom Grab Sampler with the Extension Handle

- 6.4.1 Inspect the sampler to ensure all parts are in good working condition.
  - 6.4.2 Decontaminate the sampler according to the procedures in SOP 3-06, Equipment Decontamination.
  - 6.4.3 Attach the extension handle to the top of the sampler with machine bolts.
  - 6.4.4 Arm the sampler according to the procedures described in steps 6.3.3 and 6.3.4 above.
  - 6.4.5 Using the extension handle, lower the sampler to a point 4-6" above the sediment surface, and drop the sampler to the sediment, keeping the sampler vertical at all times.
  - 6.4.6 Trigger the trip assembly by depressing the button on the upper end of the extension handle. This will cause the two cable loops to be released from the Twin-Pin™ pins, and the spring-loaded scoops of the sampler will automatically close.
  - 6.4.7 While keeping the sampler vertical, bring the sampler over to a decontaminated stainless steel bowl. Inspect the sampler to ensure that an acceptable sample has been collected (See Figure 4). If the sample is not acceptable, discard the sample in an area that is not proximal or upstream to the area or subsequent areas that are being sampled.
  - 6.4.8 Collect samples according to the procedures described in steps 6.3.8 through 6.3.13 above.
- 6.5 Wildco® Hand Corer with the Push Handles
- 6.5.1 Inspect the sampler to ensure all parts are in good working condition:
    - Assemble and disassemble the core tube from the head and nose piece to make sure the threads are not binding. If the threads are binding, consult the manufacturer's directions.
    - Make sure that the CAB plastic liner can slide easily in and out of the core tube.
    - Make sure the bottom edge of the core tube and nose piece are sharp and free from nicks or dents. If necessary, file smooth using a round file.
    - Check the flutter valve for ease of movement.
    - Check the flutter valve seat to make sure it is clear of any obstruction, disfigurement, grease, and/or oil that could prevent a tight closure.
  - 6.5.2 Decontaminate the sampler according to the procedures in SOP 3-06, Equipment Decontamination.
  - 6.5.3 Screw the corer head onto the core tube, and screw the two handles onto the corer head.
  - 6.5.4 Insert a CAB plastic liner into the core tube, insert a core catcher onto the end of the CAB plastic liner (stainless steel for normal sediments, Eggshell™ for wet sediments), and screw the stainless steel nose piece onto the core tube. If using the hand corer from a boat, bridge, high dock, etc., be sure that the appropriate extension handle (5', 10' or 15') is attached to the corer head.
  - 6.5.5 Get in position over the sampling location. If wading in shallow water, be sure to approach the sample location from the downstream side. Line up the sampler, aiming it vertically for the point where the sample is being taken, and push the hand corer in a smooth continuous motion through the water and into the sediment. Increase the thrust as necessary to obtain the penetration desired. Do not hammer or pound the corer into the sediment.
  - 6.5.6 Retrieve the sample by pulling straight up on the handles, keeping the corer as vertical as possible. If the corer has not been completely submerged, close the flutter valve by hand and press it shut while the sample is being retrieved. The flutter valve must be kept very wet if it is to seal properly and prevent sample washout. If the substrate is gripping the corer too tightly, gently rock the top of the corer back and forth horizontally to increase the size of the hole created by the corer and reduce the pull-out suction.

- 6.5.7 Unscrew the nose piece from the corer and cap the bottom end of the CAB core liner. Release the flutter valve to free the CAB core liner, and slide the CAB core liner from the core tube. Cap the top of the CAB core liner and inspect the CAB core liner for recovery. If the recovery is adequate, proceed to step 6.5.8. If the recovery is not adequate, resample the location by repeating steps 6.5.3 through 6.5.7.
- 6.5.8 Bring the CAB core liner with the sediment sample over to the geologist table, keeping the core vertical. Place the CAB core liner on the geologist table and cut open with a core liner cutter. If AVS/SEM samples are to be collected, collect the AVS/SEM sample directly from the sediment contained in the core liner according to the procedures specified in the project-specific SAP. If VOC samples are to be collected, collect the VOC samples by inserting a syringe, Terra Core sampler, or other VOC sampling device directly into the sediment core. Consult the project-specific SAP for project-specific VOC sediment sampling procedures. Once the VOC samples have been collected, collect an additional aliquot for the VOC percent solids sample directly from the sediment core.
- 6.5.9 Once the AVS/SEM and VOC samples have been collected (or if AVS/SEM and VOC samples are not required), use a decontaminated stainless steel spoon to transfer the remaining sediment core into a decontaminated stainless steel bowl.
- 6.5.10 If additional aliquots are necessary to provide adequate sample volume, repeat steps 6.5.3 through 6.5.8 until an adequate sample volume has been collected, taking care to deploy the corer to an area that is proximal, but not on top of, the previous sample location.
- 6.5.11 Once an adequate sample volume has been collected, homogenize the sample in the stainless steel bowl, record the sediment sample information on the Sediment Sample Collection Form (see Attachment 1), and collect the sediment samples according to the procedures specified in the project-specific SAP (typically in order of decreasing volatility).
- 6.6 Wildco® Hand Corer with the Clevis and Line
  - 6.6.1 Inspect the corer as described in step 6.5.1 above.
  - 6.6.2 Decontaminate the sampler according to the procedures in SOP 3-06, Equipment Decontamination.
  - 6.6.3 Screw the corer head onto the core tube. Attach the 3/16" braided polyester line to the corer by passing the line through the clevis in the corer head and knotting it securely. Strong, tight knots are essential to prevent losing the corer. If necessary, attach the auxiliary weights to the sampler according to the manufacturer's directions.
  - 6.6.4 Insert a CAB plastic liner into the core tube, insert a core catcher onto the end of the CAB plastic liner (stainless steel for normal sediments, Eggshell™ for soupy sediments), and screw the stainless steel nose piece onto the core tube.
  - 6.6.5 Position the corer over the drop point and steady momentarily, making sure to keep the corer vertical at all times. Make sure to arrange the 3/16" braided polyester line to run freely. Since the corer's penetration is by simple gravity, it is important that there be no restraint on the corer during descent by stricture on the line. Keep a firm hold on the free end of the line, or tie it to the boat (if applicable) or some other permanent fixture.
  - 6.6.6 Drop the corer into the water, and allow the corer to free fall until it hits the sediment surface. The corer should not be dropped to depths greater than 20' to 30'. Dropping the corer to depths greater than 20' to 30' may result in the corer striking the sediment surface at an angle less than 90°, resulting in an unsatisfactory sample.
  - 6.6.7 Once the corer has entered the sediment and is no longer falling, draw the line taut, and then pull on the line to pull the corer from the sediment. Once the corer has been pulled free from

the sediment, bring the corer back to the surface by pulling up the line, using a smooth, hand-over-hand fashion. This movement automatically causes the flutter valve to close, preventing sample washout in all but the soupiest of sediments.

- 6.6.8 Once the corer has been returned to the surface, lift the corer clear of the water, being careful to keep the corer as vertical as possible at all times.
- 6.6.9 Collect the sediment sample according to the procedures outlined in steps 6.5.6 through 6.5.11 above.

## **7.0 Quality Control and Assurance**

- 7.1 Field personnel will follow specific quality assurance (QA) guidelines as outlined in the project-specific SAP. The goal of the QA program should be to ensure precision, accuracy, representativeness, completeness, and comparability in the project sampling program.
- 7.2 Quality control (QC) requirements for sample collection are dependent on project-specific sampling objectives. The project-specific SAP will provide requirements for sample preservation and holding times, container types, sample packaging and shipment, as well as requirements for the collection of various QC samples such as trip blanks, field blanks, equipment rinse blanks, and field duplicate samples.

## **8.0 Records, Data Analysis, Calculations**

- 8.1 Records will be maintained in accordance with SOP 3-03, Recordkeeping, Sample Labelling, and Chain-of-Custody. Various forms are required to ensure that adequate documentation is made of the sample collection activities. These forms may include:
- Sample Collection Records;
  - Field logbook;
  - Chain-of-custody forms; and
  - Shipping labels.
- 8.2 Sample collection records (Attachment 1) will provide descriptive information for the sediment samples collected at each location.
- 8.3 The field logbook is kept as a general log of activities and should not be used in place of the sample collection record.
- 8.4 Chain-of-custody forms are transmitted with the samples to the laboratory for sample tracking purposes.
- 8.5 Shipping labels are required is sample coolers are to be transported to a laboratory by a third party (courier service).

## **9.0 Attachments or References**

Attachment 1 – Sediment Sample Collection Record

Figure 1 – Petite Ponar® Grab Sampler and Exploded Diagram

Figure 2 – Ekman Bottom Grab Sampler (Large, Tall, and Standard Sizes) and Exploded Diagram

Figure 3 – Wildco® Hand Corer (with Case and Accessories) and Exploded Diagram

Figure 4 – Illustrations of Acceptable and Unacceptable Grab Samples



NAVSEA T0300-AZ-PRO-010. *Navy Environmental Compliance Sampling and Field Testing Procedures Manual*. August 2009.

U.S. Environmental Protection Agency (U.S. EPA). 2001. *Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual*. October.

Wildlife Supply Company. 2003. 2424- Hand Corer Instructions.

Wildlife Supply Company. 2004. Ekman Bottom Grabs Instructions and Maintenance.

Wildlife Supply Company. 2004. 1728-G30/ 1728-G40 Petite Ponar<sup>®</sup> Grab.

SOP 3-05, *IDW Management*.

SOP 3-06, *Equipment Decontamination*.

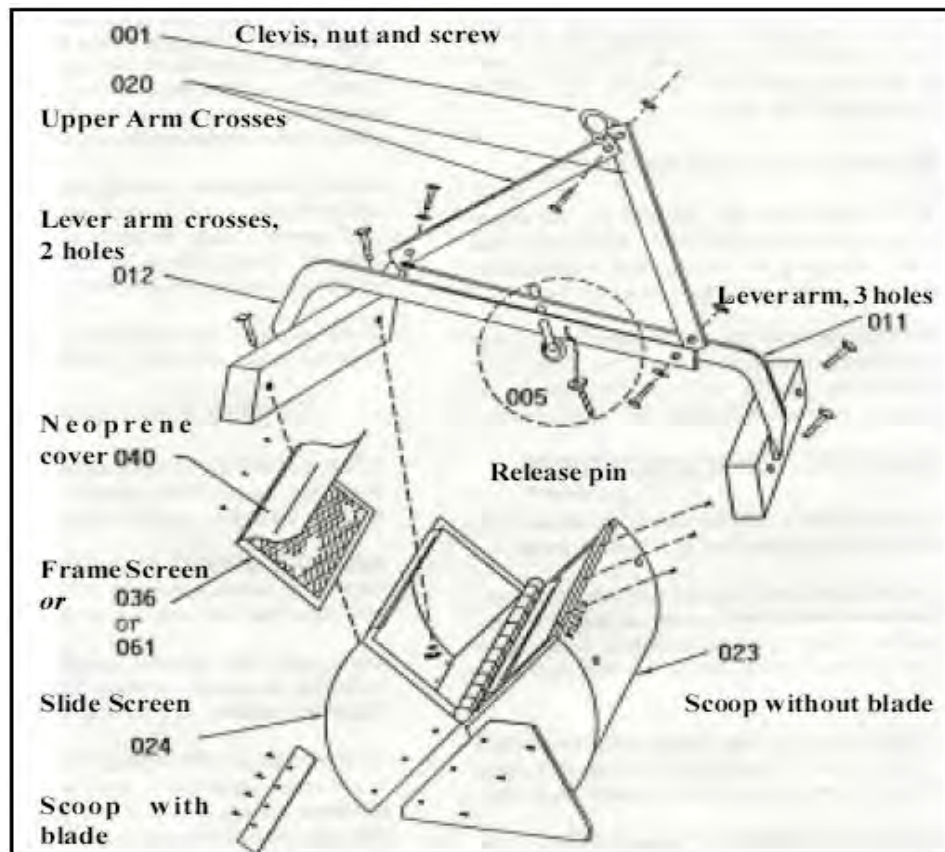
<i>Author</i>	<i>Reviewer</i>	<i>Revisions (Technical or Editorial)</i>
Robert Shoemaker Senior Scientist	Chris Barr Program Quality Manager	Rev 0 – Initial Issue (May 2012)

## Attachment 1

### Sediment Sample Collection Record

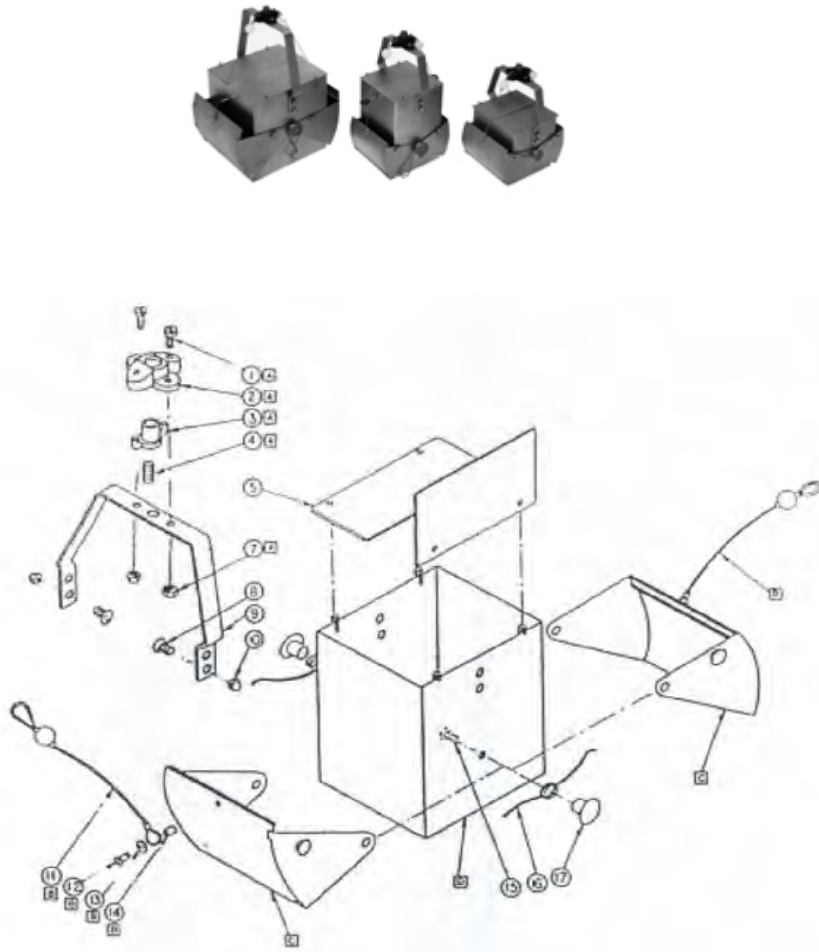
SEDIMENT SAMPLE COLLECTION FORM			
Project Name:			
Date(s):			
Project #:		Date:	
Sample Location ID:		Time:	
Sample #:		Weather:	
Samplers:			
<b>Sample Information:</b>			
Sample Depth:		Sampling Device:	
Water Depth:			
Distance from River Bank:			
River Flow Rate:			
Field Decon:		Sample Type:	
Yes      No		Grab      Composite	
Dedicated			
Munsell Color:			
Sample Description:			
Other physical characteristics of water body at sample location: (Water color, turbidity, odor, presence of sheens, dead/stressed vegetation)			
Sample Comments/Description:			

**Figure 1**  
**Petite Ponar® Grab Sampler and Exploded Diagram**



**Figure 2**

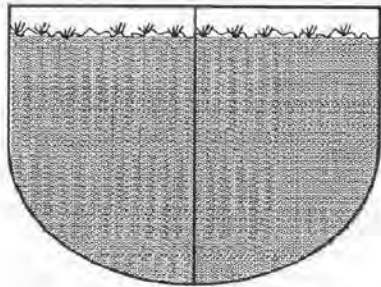
**Ekman Bottom Grab Sampler (Large, Tall, and Standard Sizes) and Exploded Diagram**



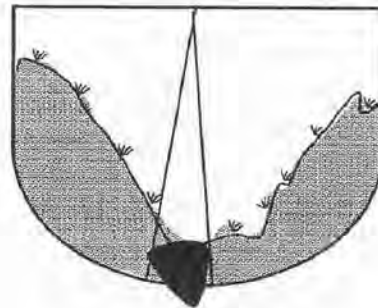
**Figure 3**  
**Wildco® Hand Corer (with Case and Accessories) and Exploded Diagram**



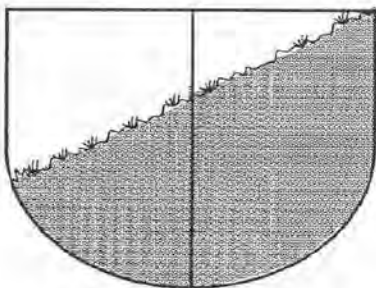
**Figure 4**  
**Illustrations of Acceptable and Unacceptable Grab Samples**



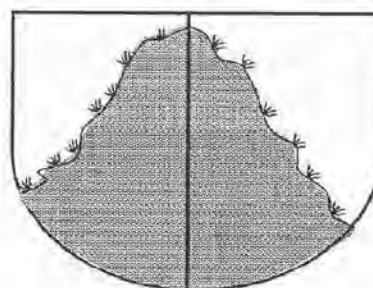
Acceptable if Minimum  
Penetration Requirement Met  
and Overlying Water is Present



Unacceptable  
(Washed, Rock Caught in Jaws)



Unacceptable (Canted with  
Partial Sample)



Unacceptable  
(Washed)

The page features three thin, black, straight lines that intersect to form a large, irregular geometric shape. One line runs diagonally from the top-left towards the bottom-right. Another line runs diagonally from the bottom-left towards the top-right. A third line runs from the left edge towards the top-right, intersecting the other two. These lines create a series of nested triangles and quadrilaterals across the page.

# Appendix E - Accident Prevention Plan



# **ACCIDENT PREVENTION PLAN**

## **DRAFT**

# **Phase 2 Regional Site Inspections for Per-fluorinated Compounds at Multiple Air National Guard Installations**

**Contract Number: W9133L-14-D-0001  
Task Order Number: 0007**

***Prepared for:***

Air National Guard  
Joint Base Andrews, Maryland

***Prepared by:***

AECOM  
3101 Wilson Boulevard, Suite 900  
Arlington, VA 22201

Project No: 60520893



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Attachment B	AECOM Safety and Health Policy Statement
Attachment C	AECOM SH&E Standard Operating Procedures Table of Contents
Attachment D	Hazard Communication Program
Attachment E	Respiratory Protection Plan
Attachment F	Sanitation Plan
Attachment G	Alcohol and Drug Abuse Policy
Attachment H	Cold Stress Prevention Plan and Heat Stress Prevention Plan
Attachment I	Site Safety and Health Plan

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## List of Acronyms and Abbreviations

AHA	Activity Hazard Analysis
ANG	Air National Guard
ANSI	American National Standards Institute
APP	Accident Prevention Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CO	Contracting Officer
CPR	Cardiopulmonary Resuscitation
DO	Delivery Order
ERP	Emergency Response Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HTRW	Hazardous Toxic Radiological Waste
IDW	Investigation-Derived Waste
MSDS	Material Safety Data Sheet
NFA	No Further Action
NGB	National Guard Bureau
OSHA	Occupational Safety and Health Administration
PM	Project Manager
PPE	Personal Protective Equipment
PRL	Potential Release Locations
QC	Quality Control
RI	Remedial Investigation
SH&E	Safety, Health & Environmental
SI	Site Investigation
SOPs	Standard Operating Procedures
SOW	Statement of Work
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SZ	Support Zone
U.S.	United States
USEPA	United States Environmental Protection Agency
WP	Work Plan
µg/L	micrograms per liter

# 1 Signature Sheet

This Accident Prevention Plan (APP) was prepared for employees performing site investigation activities at multiple Air National Guard (ANG) sites in the United States. It was prepared based on the best available information regarding the physical and chemical hazards known or suspected to be present at the project sites. While it is not possible to discover, evaluate, and protect in advance against all possible hazards that may be encountered during the completion of the project, adherence to the safety and health program requirements of this APP will significantly reduce the potential for occupational injury.

Plan Concurrence:

\_\_\_\_\_  
TBD  
Site Safety and Health Officer, AECOM

Date: \_\_\_\_\_

Plan Approver:

\_\_\_\_\_  
Alberto Munuera  
Safety and Health Manager, AECOM

Date: \_\_\_\_\_

Plan Concurrence:

\_\_\_\_\_  
Mike Myers  
Project Manager, AECOM

Date: \_\_\_\_\_

Plan Concurrence:

\_\_\_\_\_  
Mark MacEwan, PE  
Program Manager, AECOM

Date: \_\_\_\_\_

## 2 Background Information

### 2.1 Contractor

The prime contractor for the Phase 2 Regional Site Inspections for Per-flourinated Compounds at Multiple Air National Guard Installations is AECOM.

### 2.2 Contract Number

The project is being conducted under the National Guard Bureau (NGB) Contract No. W9133L-14-D-0001, Delivery Order (DO) 0007.

### 2.3 Project Name

The project name is Phase 2 Regional Site Inspections for Per-flurinated Compounds at Multiple Air National Guard Installations (hereinafter, PFC Site Investigation).

### 2.4 Project Description

The primary objective of the Task Order is to collect data to support Site Investigation (SI) reports at multiple Air National Guard Installations. NGB/A7OR's goal for the SI is to obtain either a No Further Action (NFA) decision with regulatory concurrence, or determine the presence of contamination and identify the Data Quality Objectives (DQOs) required for conducting follow on Remedial Investigations at the Potential Release Locations (PRLs) that do not meet the criteria for No Further Action (NFA).

AECOM will conduct SIs at nineteen subject installations. This APP is applicable for all subject installations.

#### 2.4.1 Description of Work to Be Performed

PFC SI activities are being performed under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The state and federal environmental agencies in which the respective site resides is the regulatory lead for this project. The field investigation tasks planned as part of the field operations at the various installations may include:

- **Utility Clearance and Geophysical Survey.** Utility clearance will be conducted by an approved entity. A geophysical survey, if required, will be conducted by a subcontractor.
- **Concrete Coring.** If required, concrete coring will be conducted to access subsurface soils for sampling.
- **Soil Borings and Soil Sample Collection.** Soil samples will be collected at designated locations via direct-push technology (DPT). A GeoProbe® DT325 dual-tube sampling system (or equivalent) will be used to collect continuous soil cores to the target depth. Borings will be advanced to depths ranging from 10 to 45 ft, or to probe refusal, whichever occurs first.
- **Monitoring Well Installation.** Permanent monitoring wells will be installed using DPT and or roto sonic methodology, consisting of 1 inch Schedule 40 PVC screen that will be installed in the borehole, ranging in depth from 10 to 45 ft; filter sand will be placed in the annulus surrounding the well screen to a depth of 1 foot above the top of screen.
- **Groundwater Measurement and Sampling.** Groundwater samples will be collected from existing and the new wells. Samples will be collected via low-flow sampling methods using bladder pumps.
- **Surface Water and Sediment Sampling.** Surface water and sediment will be collected from various locations utilizing industry standard techniques.

### **2.4.2 Project Location**

Location maps of each ANG installation included in this task order are provided in the Work Plan.

### **2.4.3 Project Phases of Work**

The project phases of work and hazardous activities requiring Activity Hazards Analyses (AHAs) in the SSHP include the following:

- Mobilization and Demobilization;
- Soil Borings and Soil Sample Collection;
- Groundwater Sampling
- Surface water and sediment sampling
- Concrete Coring

## **2.5 AECOM's Accident Experience**

AECOM Environment utilizes the skills and capabilities from across its global environmental operations. AECOM Environment is devoted to providing quality environmental services to its global clients and provides a blend of global reach, local knowledge, innovation, and technical excellence in delivering solutions that enhance and sustain the world's built, natural, and social environments. AECOM Environment's activities are primarily classified in the Engineering Services industry (NAICS 54133).

AECOM's recordable cases and rates for United States-based projects can be provided upon request. An example copy of a blank AECOM OSHA 300 log is located in Attachment A.



### 3 Statement of Safety and Health Policy

AECOM management and employees are fully committed to providing a safe and healthful workplace for all employees and maintaining compliance with the Safety, Health and Environment policy. AECOM's current corporate safety and health policy statement detailing this commitment is included as Attachment B.

## 4 Responsibilities and Lines of Authority

### 4.1 Statement of Responsibility

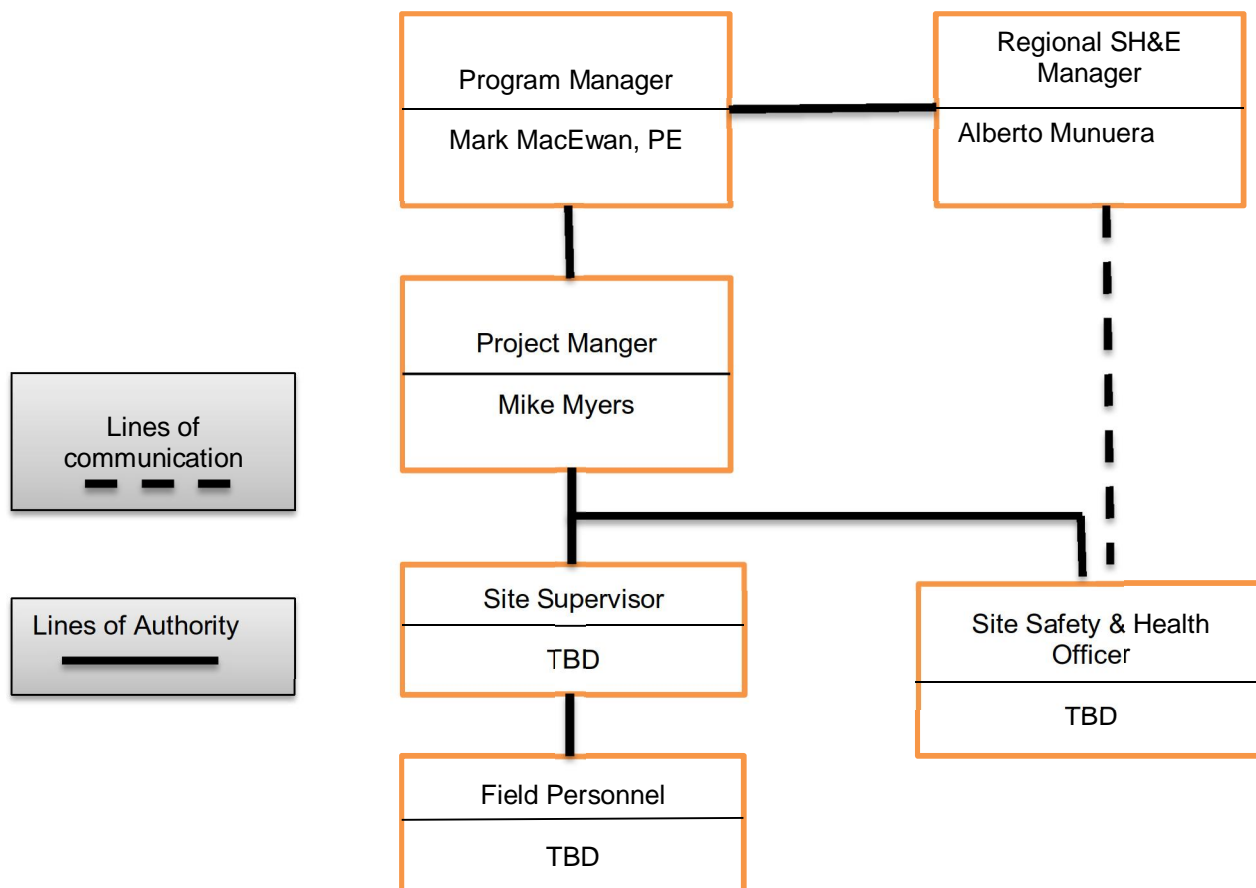
AECOM has the ultimate responsibility for the successful implementation and management of the PFC SI safety and health program.

### 4.2 Personnel Responsible for Safety

All personnel are responsible for continuous adherence to the safety and health procedures presented in this APP and attached SSHP during the performance of work. No person may work in a manner that conflicts with the intent of, or the inherent safety and environmental precautions expressed in these procedures. After due warnings, the company will dismiss from the site any person who violates safety procedures.

The AECOM organization chart for the management of safety at both the corporate and project level for the PFC SI project is presented as Figure 4-1. The positions/responsibilities presented in the organization chart are discussed below.

**Figure 4-1**  
**Safety Organization Chart**



#### **4.2.1 Program Manager [Mr. Mark MacEwan P.E.]**

The AECOM Program Manager is responsible for supporting the establishment and oversight of the overall health and safety program presented in the APP. The Program Manager will sign the APP prior to final submittal.

#### **4.2.2 Regional SH&E Manager [Alberto Munuera]**

The AECOM SH&E Manager is a safety professional with over 10 years of experience in managing safety and occupational health at hazardous waste site cleanup operations.

The SH&E Manager is responsible for developing, maintaining, and overseeing the implementation of the APP and SSHP. The SH&E Manager will approve the APP and SSHP prior to final submittal. Specific responsibilities of the SH&E Manager includes the following:

- Approve the appointment of the Site Safety and Health Officer (SSHO) and ensure that he/she has the appropriate training and competencies to perform the duties;
- Participate in quality control (QC) planning such as development of Quality Control Plans, safety and health checklists, and perform design and system safety analyses as appropriate;
- Visits the project as needed to audit the effectiveness of the safety and health program;
- Provide safety and health expectations and flow down requirements for subcontractor statements of work;
- Be available on a 24-hour basis for consultation with the SSHO during on-site emergencies or as needed;
- Coordinate any modifications to the safety plans with the SSHO and PM, as required;
- Evaluate occupational exposure monitoring/air sampling data and adjust APP/SSHP requirements as necessary;
- Provide continued support for upgrading and/or downgrading the level of personal protective equipment (PPE);
- Participate in the investigation of unplanned events, high loss potential incidents, and accidents; and
- Assist in development of on-site training, which will be provided by the SSHO.

#### **4.2.3 Project Manager [Mr. Mike Myers]**

The AECOM Project Manager (PM) represents the company in all aspects of the project work and is responsible for the following:

- Providing leadership by, among other things, setting an example for all site personnel through actions and words regarding the importance of proper health and safety practices and holding project staff accountable for safety performance;
- Coordinating all work performed by AECOM personnel and subcontractors for the project;
- Ensuring the APP/SSHP is approved prior to commencing field operations;
- Ensuring all required PPE, other types of equipment and instruments, safety incentives, and other safety-related items are budgeted and provided;
- Ensuring that subcontractor Statements of Work include appropriate safety provisions and expectations;
- Ensuring that safety and health requirements are covered during kickoff meetings;
- Participating in the investigation of, and ensuring that unplanned events, high loss potential incidents, and accidents are properly reported to NGB;
- Notifying the Regional SH&E Manager of any changes in the scope of work or site conditions, and ensuring that the APP/SSHP is updated to address new hazards;

- Immediately stopping operations in the event of an emergency or serious hazard, in order to protect personnel and the environment; and
- Preparing and submitting required work progress reports.

#### **4.2.4 Site Safety and Health Officer [TBD]**

The AECOM SSHO will be responsible for managing, implementing, and enforcing AECOM's health and safety program in accordance with the accepted APP. The SSHO will be a competent person that can identify existing and predictable hazards in the working environment or working conditions that are dangerous to personnel, and who has authorization to take prompt corrective measures to eliminate them. The SSHO will have the authority and is responsible for the following actions:

- Review investigation operations to implement the APP/SSHP;
- Inspect site activities to identify safety and occupational health deficiencies and correct them;
- Coordinate changes/modifications to the APP/SSHP with the Regional SH&E Manager, PM, and Site Supervisor;
- Conduct project-specific OSHA training;
- Ensure all field personnel, including any subcontractor personnel assigned to the project, have satisfied requirements for training and medical surveillance as specified by 29 Code of Federal Regulations (CFR) 1910.120, and that records of training and medical approval are available and maintained for each person;
- Oversee compliance with the APP/SSHP procedures and OSHA regulations;
- Serve as a member of the QC staff on matters relating to safety and health;
- Stop work if unacceptable safety and health conditions exist, and take necessary action to re-establish and maintain safe working conditions;
- Review operations and maintenance records of air monitoring equipment required at a site for airborne contaminants and prepare air monitoring reports; and
- Maintain all required safety and health records (e.g., OSHA 300 Logs, incident/accident reports, training certificates and qualifications, equipment checklists, safety plans, air monitoring data and reports, etc.) throughout the life of the project.

#### **4.2.5 Site Supervisor**

The Site Supervisor will manage the on-site investigation operations in accordance with the approved Work Plan and APP/SSHP. The Site Supervisor will coordinate all on-site personnel and equipment conducting investigation operations in a safe manner. The Site Supervisor will coordinate all work with the SSHO to address all safety concerns adequately. The Site Supervisor will immediately stop work in the event of an emergency or serious hazard in order to protect personnel and the environment. The Site Supervisor will work with the Regional SH&E Manager, PM, and SSHO in coordinating changes/modifications to the APP/SSHP, as needed.

#### **4.2.6 Field Personnel**

Field Personnel will be responsible for understanding and following the APP/SSHP and performing their work in a safe and responsible manner. Specific responsibilities will include the following:

- Act in a responsible manner at all times in order to prevent incidents, injury, and/or exposure to themselves and their co-workers;
- Report any and all incidents, including near misses, to the Site Supervisor or SSHO;
- Attend and participate in all daily health and safety tailgate meetings;
- Participate in the development of AHAs as required, and follow the provisions as outlined in the final AHAs;

- Follow instructions and directions of the Site Supervisor and SSHO;
- Utilize the prescribed PPE provided for each task;
- Following all field safety procedures for safe work practices (e.g., the buddy system, communication, site control, decontamination, evacuations, and related emergency procedures);
- Perform only those tasks they have been instructed to perform if they are trained, qualified, and capable of performing safely at the time of assignment;
- Report any personal condition that could affect their safety and/or the safety of co-workers (e.g., fatigue, drowsiness, severe illness, impairment by prescription medications, influence by drugs and alcohol, emotional stress, or other condition); and
- Ensure that no work tasks are performed in deviation from the APP/SSHP and/or the initial instructions of the Site Supervisor and SSHO.

### 4.3 Competent Person Work Requirements

In order to complete investigation tasks, an OSHA-designated competent person must be on site to perform the required daily inspections of equipment and/or operations. No work will be performed unless a designated competent person is present on the job site. The training requirements for competent persons are specified in the S3NA-202-PR, *Competent Person Designation* (refer to Attachment C).

### 4.4 Lines of Authority

Figure 4-1 illustrates the lines of authority for the personnel responsible for project safety.

### 4.5 Safety Disciplinary Policy

Employee non-compliance with safety requirements is taken very seriously by AECOM management. Personnel not following procedures are warned and counseled on the proper safety procedures and if the problem persists, are again counseled with notations made in their permanent record. Continued non-compliance can lead to termination of employment.

AECOM has developed the following progressive discipline policy for the violation of safety requirements. Extremely careless or reckless violations may result in immediate termination.

**First Violation:** An oral warning will be given for the first violation of a SH&E requirements depending on the severity of the violation. The employee will be informed by his or her supervisor of the violation and of the correct safe practice or procedure. The supervisor will review with the employee all applicable safety and health workplace requirements and guidelines. The employee must sign a statement indicating understanding of those requirements and guidelines. The supervisor should inform the employee that future violations will result in higher levels of discipline and may lead to dismissal.

**Second Violation:** The employee may be given a written warning for the second documented safety and health requirement violation. This warning will specifically identify the violation. The warning will also refer the employee to applicable safety and health requirements and guidelines for review, and also show the date the employee previously read and signed the statement of understanding of safety and health requirements and guidelines. The employee, the employee's supervisor, the department head, Human Resources, and the employee's personnel file receive copies of the warning.

**Third Violation:** the employee may be given a final warning for the third documented violation of safety and health requirements or guidelines. This warning will specifically identify the violation. It will also state that any further violation of safety and health requirements and guidelines will result in dismissal. All persons who receive a copy of the previously written warning will receive a copy of the final warning.

**Any Subsequent Violation:** the employee may be dismissed for a subsequent violation. If dismissed, the employee will receive a letter specifically identifying the violation of the safety and health requirement or guideline, as well as rights of appeal through the grievance process.

**Immediate Termination:** On occasion, an employee will commit a violation of a safety and health requirement or guideline that is so careless and reckless, or that so endangers life or property, that it can

be considered imminently dangerous. When this occurs, an employee may be dismissed immediately, without benefit of any warnings. An employee dismissed in this fashion will receive a letter specifically identifying the violation and setting out his/her right of appeal within the grievance process.

Discipline for Subcontractor Personnel: If noncompliance actions are committed by subcontractor personnel, AECOM will recommend that the employer discipline the employee. If the action continues, AECOM will have the employer remove the employee from the site.

Documentation: Employee warnings and disciplinary actions will be documented using AECOM's Corporate Memorandum format in a manner consistent with the requirements of this policy.

#### **4.6 Manager and Supervisor Accountability**

Managers and supervisors are responsible for enforcing safety and health as part of their job descriptions. They are ultimately responsible for protecting the welfare of the employees, as well as minimizing the potential liability associated with on-the-job accidents. Annual performance reviews and incentive plans for managers and supervisors include the assessment of both the individual's safety performance as well as their project safety performance.

## 5 Subcontractors and Suppliers

Various subcontractors and suppliers will be used to execute the project, subcontractors selection will be based on their safety compliance history with OSHA, prior experience with AECOM, the NGB, and their Experience Modification Rating (EMR). AECOM will use subcontractor and suppliers with an EMR of less than or equal to one.

Subcontractors and suppliers are required to provide a safe and healthful working environment for employees that are free from recognized hazards that are causing or likely to cause harm to their employees and other project personnel.

Subcontractors and suppliers are responsible for compliance with the safety and health requirements found in EM 385-1-1 (3 November 2008). In addition, subcontractors and suppliers are responsible for compliance with the safety and health requirements set forth in the APP.

Subcontractors working on the project site are required to designate a competent person –who can identify existing and predicable hazards in the working environment or working conditions that are, dangerous to personnel and who has authorization to take prompt corrective measures to eliminate them.

The subcontractor shall immediately correct any unsafe conditions that are brought to its attention. When unsafe conditions are not corrected to the satisfaction of AECOM work will be stopped. The work stoppage will be in place until the corrective steps to eliminate the unsafe conditions are taken.

Where the subcontractor fails to correct the unsafe conditions and/or repeatedly fails to comply with the safety and health requirements as found in EM 385-1-1, or the requirements of this AAP and specific safety plans, AECOM will take the following action:

- Stop work until the conditions are corrected to the satisfaction of AECOM.
- Meet with the subcontractors management team
- Send a written notice of non-compliance to the subcontractor, AECOM Procurement and Project Managers.
- Initiate contract termination procedures.

Personnel refusing or repeatedly failing to comply with AECOM job safety requirements, or supervisors failing to enforce compliance with these and referenced standards shall be, promptly disciplined by their employer, which at AECOM's discretion, and may include removal from the project.

### 5.1 List of Subcontractors

The following subcontractors will be utilized for the PFC SI field activities:

- Driller for concrete coring/soil boring/sampling/well installation;
- Geophysics to locate potential leach fields/underground storage tanks/utilities
- Land Surveyor to locate soil borings and monitoring wells;
- Waste transportation and disposal subcontractor for removal and disposal of investigation-derived waste (IDW); and
- Various suppliers for field sampling equipment and health and safety supplies.

### 5.2 Regulatory Requirements

The work performed shall comply with the safety and health requirements as found in EM 385-1-1 and OSHA Construction Industry Standards (29 CFR 1926). Where, the safety requirements of EM 385-1-1 and of this APP vary from the 29 CFR 1926, the most stringent requirement shall be followed.

Subcontractors and suppliers are required to provide a safe and healthful working environment for employees that are free from recognized hazards that are causing or likely to cause harm to their employees and other project personnel.

Subcontractors and suppliers are responsible for compliance with the safety and health requirements as found in EM 385-1-1 (3 November 2008). In addition, subcontractors and suppliers are responsible for compliance with the safety and health requirements set forth in the APP.

### **5.3 Subcontractor and Supplier Identification**

The following subcontractors will be utilized for the PFC SI field activities:

- Driller for concrete coring/soil boring/sampling/well installation;
- Geophysics to locate potential leach fields/underground storage tanks/utilities
- Land Surveyor to locate soil borings and monitoring wells;
- Waste transportation and disposal subcontractor for removal and disposal of investigation-derived waste (IDW); and
- Various suppliers for field sampling equipment and health and safety supplies.



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## 6 Training

### 6.1 Indoctrination Training

Prior to the first work shift or visit, all personnel shall receive safety indoctrination given by the SSHO or delegate. The indoctrination shall be relevant to the work being undertaken and pertinent provisions of the AAP and the project health and safety plan. Indoctrination shall include but not be limited to:

- Requirements and responsibilities for accident prevention and maintaining safe and healthful work environments;
- General safety and health policies and procedures and pertinent provisions of this APP;
- Employee and supervisor responsibilities for reporting all accidents;
- Provisions for medical facilities and emergency response and procedures for obtaining medical treatment or emergency assistance;
- Procedures for reporting and correcting unsafe conditions or practices;
- Job hazards and the means to control/eliminate those hazards, including applicable activity hazard analyses; and project specific training

### 6.2 Mandatory Training and Certifications

AECOM will verify that personnel under their control have received the necessary safety training. Training shall comply with the NGB and OSHA's Safety and Health training requirements. Documentation and certificates of training will be kept on site and available for inspection by Government Designated Authority (GDA). At minimum, depending on the tasks performed and the hazards involved, personnel shall be trained on the following:

- Hazardous Communication/Right to Know
- Control of hazardous energy (lockout)
- 40-hour HazWoper training
- 8-hour HazWoper annual refresher training
- 8-hour HazWoper Supervisor training
- 30 hour Construction Safety Awareness training (supervisors and SSHO)
- First aid and Cardiopulmonary Resuscitation (CPR) training (at least two) from each employer
- Personal protective equipment

As site condition and hazards change, employees shall be trained on the following:

- Confined space
- Fall prevention/protection
- Respiratory protection
- Lead Hazards
- Asbestos

### 6.3 Training Schedule

Mandatory training will be conducted off-site by either an in-house training program or by outside instructors. As applicable, training will be conducted on-site by the Supervisors, or by outside resources.

When supervisory personnel has reason to believe that any person who has already been trained does not have the understanding and skill required the person will be retained by the SSHO or supervisory personnel or by an outside trainer.

Circumstances where retraining is required include, but not limited to situations where:

- Changes in the workplace render previous training obsolete
- New products (PPE) or equipment is introduced into the workplace
- Training expires (i.e. lift truck, first aid etc.)

#### **6.4 Emergency Response Training**

As part of the Emergency Response Plan (ERP) personnel will be trained in the following:

- First aid and CPR (two employees per shift)
- Location and use of alarm and communication system
- Location and use of fire extinguishers
- Location of first aid kit, telephone and spill control supplies
- Routes of escape and location of evacuation assembly area

#### **6.5 Periodic Safety and Health Training**

Safety meetings will held at the beginning of each job and at least weekly thereafter, according to the various circumstances involved or when necessary to clear working procedures. The safety meetings will be conducted by the site Supervisor. Project personnel shall attend the safety meeting and sign a meeting roster to confirm attendance. Safety Meeting for non- English speaking personnel will be held in the persons native language.

Safety meetings shall be conducted to review past activities, plan for new or changed operations, review pertinent aspects of appropriate AHA (by trade), establish safe working procedures for anticipated hazards, and provide pertinent safety and health training and motivation.

As part of the safety meeting, employee feedback (comments, questions, health or safety concerns) are welcomed. Issues addressed in the safety meetings will be documented and shall include the date, attendees, subjects discussed and names of individual(s) who conducted the meeting.

#### **6.6 Safety Bulletin Board**

Projects are anticipated to be short term in nature, using a mobile crew. For long duration projects where a field office is established a safe bulletin board will be erected and maintained.

A safety bulletin board to increase employee's safety awareness and convey the company's safety message will be installed on long term projects. The following items shall be posted on the Bulletin Board:

- Map denoting the route to the nearest emergency care facility.
- Emergency phone numbers.
- Safety and Health promotional posters.
- Date of last lost workday injury.
- Citation and Notice. If a Citation and Notice is received, it must be posted until all violations are abated
- OSHA and/or NGB required postings.

The following will be mounted on or adjacent to the bulletin board or a notice will be posted that states the location of the documents which will be accessible on the site by all workers.

- Copy of current activity hazard analysis/analyses (AHA)
- Copy of the most up-to-date accident prevention plan (APP)
- OSHA Form 300A
- Copy of Safety deficiency tracking log

## 7 Safety and Health Inspections

### 7.1 Daily Job Site Safety and Health Inspection

Due to the short duration and limited nature of the SI field work, and multiple locations of the ANG facilities, the PFC SI project SSHO may designate a qualified and competent person to conduct site specific daily job site health and safety inspections. The site specific SSHO will conduct daily jobsite health and safety inspections/audits to identify new or previously unidentified hazards, verify the effectiveness of hazard control measures, observe workers performing tasks, and provide feedback to workers. Deficiencies noted during the daily inspection will be corrected immediately, or work will be stopped in the affected area until the deficiency is corrected. The daily jobsite health and safety inspection will be documented in the SSHO logbook.

Identified safety and health issues and deficiencies, and the actions, timetable, and responsibility for correcting the deficiencies, will be recorded on an inspection form. Follow-up inspections to ensure correction of any identified deficiencies will also be conducted and documented on an inspection form.

AECOM will establish a safety and occupational health deficiency tracking log that list and monitors the status of safety and health deficiencies in chronological order. The log will be posted on a project safety bulletin board, be updated daily, and will provide the following information:

- Date of deficiency;
- Description of deficiency;
- Name of person responsible for correcting deficiency;
- Projected resolution date; and
- Date actually resolved.

Table 7-1 lists the safety and health inspection requirements for the PFC SI anticipated field operations.

**Table 7-1  
Safety and Health Inspection Requirements**

What	Who	When	Documentation
General Site Conditions	SSHO	Daily	Log Book
	SSHO	Weekly	Safety Inspection Form
	Project Manager	Monthly	Safety Inspection Form
	SH&E Manager	Quarterly	Safety Inspection Form
Tools and Equipment	Users	Daily	Tag and Remove Defective Items from Service
Personal Protective Equipment	SSHO	Initial/Monitor use Daily	Log Book

### 7.2 External Inspections and certifications

External inspections are not expected for this project. In the event that an OSHA or other regulatory agency inspection, AECOM will immediately notify and provide NGB the opportunity to accompany AECOM on the inspection. AECOM will provide NGB a copy of any citations or reports issued by the inspector and any corrective action responses to the citation(s) or report(s).

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## 8 Accident Reporting

All incidents, no matter how minor, are to be reported immediately (within 24 hours) by employees to their immediate supervisor or manager. Supervisors are responsible for ensuring that all incidents are reported immediately, subsequently documented, and investigated so that corrective action can be initiated to prevent a reoccurrence. The Supervisor shall facilitate and personally assist in the investigation of all incidents. Documents pertaining to an incident analysis must be complete and accurate.

AECOM employee is injured and requires medical treatment, the Site Supervisor will contact the Regional SH&E Manager, AECOM's Incident Reporting Line at (800) 348-5046, the PM and CO (Contracting Officer) immediately. The Site Supervisor will initiate a written report, using the Supervisor's Report of Incident form (S3NA-004-PR). The Site Supervisor will complete the first two sections of this form and forward to the PM for completion of Section 3. The report will then be provided to the Regional SH&E Manager before the end of the following shift.

For OSHA recordable injuries and illnesses, high visibility accidents (any mishap which generate publicity and/or high visibility) and property damage accidents resulting in at least \$2,000 in damages, AECOM will conduct an accident investigation to establish the root cause(s) of the accident, complete the Contractor Significant Incident Report (CSIR) form, NGB Accident Report Form 3394, and provide the report to the CO within five calendar days of the accident.

### 8.1 Accident Investigation

All accidents, no matter how minor, are subject to investigation. Reasonably, an accident causing death or serious injury will require a more thorough analysis than one resulting in a first-aid case. Any near-miss incident that might have caused harm and steady reoccurrence of minor injuries (first-aid cases) also requires investigating. Supervisory personnel shall initiate the analysis as soon after the incident as possible.

The primary focus of the investigation is to determine why the incident occurred, what actions should be taken to prevent it from reoccurring, and if employee training or retraining is required. Investigations are not intended to be faultfinding, but should seek to identify any unsafe conditions or acts that must be corrected. Such information serves an important purpose to help management learn from past mistakes in order to prevent and control hazards and potential incidents on future projects.

Questions that should be asked during an incident investigation include the following:

- What happened?  
The investigation should describe what took place to prompt the investigation (injury, damage to property, etc.).
- Why did the incident happen?  
The investigator must obtain all the facts surrounding the incident (who was involved, what caused the incident to occur, were employee(s) qualified to perform the task, etc.).
- What needs to be done to prevent reoccurrence?  
The investigator must determine what aspect of the operation or process needs additional attention. The purpose of this portion of the investigation is not to fix blame, but to give constructive recommendations for improving the work environment by establishing safe work practices or correcting unsafe conditions

### 8.2 Accident Notification

The CO and the AECOM Project Manager and Regional SH&E Manager shall be notified immediately, but not later than four hours, after any accident meeting the definition of Recordable Injuries or Illnesses

or High Visibility Accidents, property damage equal to or greater than \$2,000, or any weight handling equipment accident. Information shall include:

- Contractor name; contract title; type of contract; name of activity,
- Installation, or location where accident occurred;
- Date and time of accident;
- Name(s) of personnel injured; extent of property damage, if any;
- Extent of injury, if known; and
- A brief description of the accident (to include type of construction equipment used, PPE used, etc.).

As necessary preserve the conditions and evidence on the accident site until the Government investigation team arrives on site and Government investigation is conducted.

### **8.3 Monthly Exposure Report**

Monthly exposure reporting to the CO is required to be attached to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both prime and subcontractor. The monthly exposure as prepared by AECOM will also include type of incidents (e.g., first aid, near hits, exposure to hazardous chemicals, OSHA recordables).

### **8.4 Reports**

All incidents noted above with the exception of near miss accidents require the preparation of ENG. 3394, and AECOM Incident Report, which are available electronically from the Corporate Safety Office. ENG 3394 must be provided to the CO and EH&S Manager within five calendar days of the accident.

An incident log for: recording daily first-aid treatment, near misses, exposures and other incidents that are not otherwise reportable will be maintained on the project site. The log shall be furnished to the GDA representative upon request. AECOM will maintain a log of work-related injuries and illnesses (OSHA 300-A) in accordance with OSHA requirements.



## 9 Plans (Programs, Procedures) Required by the Safety Manual

Based on the scope of site investigation activities, all applicable safety plans, programs, and procedures to address risk and compliance requirements were identified and are described below.

### 9.1 Layout Plans

During the project work plan phase, the site layout will be planned to show the work sites, administrative areas, access and egress routes and parking areas. Staging areas for the temporary storage of equipment and supplies, as well as waste materials, will be sited. Location maps are provided in the Work Plan.

### 9.2 Hazard Communication (HAZCOM) Program

Included as Attachment D to this Accident Prevention Plan is AECOM's written hazard communication program (S3NA-115-PR1) addressing as a minimum, the following: training (to include potential safety and health effects from exposure), labeling, current inventory of hazardous chemicals on site, and the location and use of Material Safety Data Sheets (MSDSs).

### 9.3 Emergency Response Plan

An Emergency Response Plan is included in the Site Safety and Health Plan (Attachment J to this Accident Prevention Plan). This Emergency Response Plan includes site-specific emergency procedures to ensure employee safety in case of fire or other emergency, including emergency telephone numbers and reporting instructions for ambulance, physician, hospital, fire, and police. Also a map of directions to the nearest hospital(s). The plan also includes Spill Response Procedures including organizations with telephone numbers of individuals to contact in the event of a spill.

### 9.4 Firefighting Plan

AECOM personnel will not be engaged in firefighting activities. Regardless of the size and nature of the fire, and AECOM's ability to respond, all fires will be reported immediately to the local fire department

### 9.5 Respiratory Protection Plan

AECOM's Respiratory Protection Plan (S3NA-123-PR1) is included as Attachment E to this Accident Prevention Plan.

### 9.6 Health Hazard Control Program

Activity Hazard Analyses (AHA's) shall consider all substances, agents and environments that present a hazard and will recommend hazard control measures. Engineering and administrative controls shall be used to control hazards. In cases where engineering or administrative controls are not feasible, PPE may be used. The AHA shall serve as certification that a hazard assessment has been conducted.

### 9.7 Site Sanitation

AECOM's Sanitation Plan is included as Attachment F to this Accident Prevention Plan.

### 9.8 Abrasive Blasting

Not applicable

### 9.9 Confined Space

Not applicable

**9.10 Hazardous Energy Control Plan**

Not applicable

**9.11 Access and Haul Road Plan**

Not applicable

**9.12 Plan for Prevention of Alcohol and Drug Abuse**

AECOM's plan for prevention of Alcohol and Drug Abuse is included as Attachment G to the Accident Prevention Plan. This plan meets the minimum requirements of DFAR 252.223-7004.

**9.13 Excavation Plan**

Not applicable

**9.14 Lead Abatement Plan**

Not applicable

**9.15 Asbestos Abatement Plan**

Not applicable

**9.16 Critical Lifts**

Not applicable

**9.17 Demolition Plan**

Not applicable

**9.18 Fall Protection Plan**

Not applicable

**9.19 Steel Erection Plan**

Not applicable

**9.20 Night Operations**

Not applicable

**9.21 PCB Plan**

Not applicable

**9.22 Heat and Cold Stress Plan**

The SSHO has the authority to stop work or restrict work when ice, snow, lightening or other weather condition poses a potential risk to site personnel. AECOM's Cold Stress Prevention Plan (S3NA-112-PR1) and Heat Stress Prevention Plan( S3NA-113- PR1) are included as Attachment H to this Accident Prevention Plan.

**9.23 Wild Land Fire Management Plan**

This section is not applicable to the tasks being performed for this project.

## **9.24 Medical Support**

The AECOM's Occupational Medical Program has been established to ensure that the health of all employees is not compromised by potential exposure to hazardous substances and physical agents encountered in the workplace. The program requires that prompt first aid and medical treatment be given to those that are injured on the job.

AECOM personnel performing on-site work that may result in exposure to contaminant-related health and safety hazards are enrolled in the medical surveillance program that complies with OSHA standard 29 CFR 1910.120 (f)/29 CFR 1926.62 (f). They will have successfully completed a pre-placement occupational physical examination and annually thereafter. The medical surveillance program meets the following requirements:

- The physician's opinion concerning the employees' abilities to perform the assigned work shall be provided to the Regional SH&E Manager,
- The required written physician's opinion shall be made available upon request,
- All medical records are maintained in accordance with 29 CFR 1910.1020,
- Examinations are given at least once every 12 months unless the attending physician believes a longer interval (not greater than biennially) is appropriate, and
- Examinations are administered by a licensed physician who is certified by the American Board of Preventive Medicine.

AECOM will certify that all employees have successfully completed a physical examination by a qualified occupational health physician and will supply certification of medical clearance for each on-site employee.

### **Off Site Medical Support**

The off-site consulting physician for AECOM's Occupational Medical Program is Peter Greaney, M.D. Dr. Greaney is a board certified Occupational Physician (American Board of Preventive Medicine). The Doctor can be reached at:

WorkCare  
300 South Harbor Blvd  
Suite 600  
Anaheim, CA 92868  
800-455-6155

### **On-Site Medical Support**

On-site medical support will consist of individuals trained in first aid and CPR. As required by EM385-1-1 Section 3 a first aid kit(s) that meet the requirements of ANSI Z308.1-2003 will be maintained on site. At least two employees on each shift will be qualified to administer first aid. The first aid qualified people are as follows:

- Site supervisor
- SSHO

**9.25 Process Safety Management Plan**

This section is not applicable to the tasks being performed for this project.

**9.26 Site Safety and Health Plan for HTRW Work**

See the site-specific SSHP, Attachment I to this APP.

## 10 Risk Management Processes

Detailed site specific hazards and controls will be provided in the activity hazard analysis (AHA) for each phase of the operation (each Major Definable Feature of Work as defined by the Contractor Quality Control Plan). The AHA's will provide information on how the requirements of major sections of EM 385-1-1 will be met. Particular attention shall be paid to:

- Physical Hazards
  - Struck by
  - Caught in or between
  - Electrical shock
  - Falls
  - Noise
  - Fire/explosion
  - Confined Space
- Health Hazards
  - Chemicals
  - Biological (flora and fauna)
  - Non-ionizing radiation ( intense light)
  - Heat and cold stress
  - Musculoskeletal disorder (MSD)

The control measures that will be employed to manage the risk follow the hierarchy of controls, which are as follows:

- Elimination ( design it out) **Most Effective Control**
- Substitution ( use something else)
- Engineering controls (isolation, guarding)
- Administrative controls ( training, work schedule signage)
- Personal protective equipment **Least Effective Control**

The AHAs will be considered a “living document” with revisions incorporated based on actual work activities being performed. The contents of the AHAs will be communicated to affected personnel before work begins and shall be periodically reviewed with affected personnel thereafter.

The specific AHAs identifying the project-specific task hazards and controls are presented in the SSHP, Attachment J to this APP

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## **Attachment A**

### **AECOM OSHA 300 Form**

Log of Work-Related Injuries and Illnesses

You must record information about every work-related death and about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR Part 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an Injury and Illness Incident Report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Establishment name
City State

Identify the person Describe the case Classify the case
(A) Case no. (B) Employee's name (C) Job title (e.g., Welder) (D) Date of injury or onset of illness (E) Where the event occurred (e.g., Loading dock north end) (F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (e.g., Second degree burns on right forearm from acetylene torch)
Classify the case: CHECK ONLY ONE box for each case based on the most serious outcome for that case:
Remained at Work: Death (G), Days away from work (H), Job transfer or restriction (I), Other recordable cases (J)
Enter the number of days the injured or ill worker was: Away from work (K), On job transfer or restriction (L)
Check the "Injury" column or choose one type of illness: (M) Injury, Skin disorder, Respiratory condition, Poisoning, Hearing loss, All other illnesses

Public reporting burden for this collection of information is estimated to average 11 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any other aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.





## **Attachment B**

### **AECOM Safety and Health Policy Statement**

# Safety, Health and Environment Policy Statement

## PURPOSE

This policy establishes the framework to attain Best-In-Class Safety, Health and Environmental (SH&E) performance for AECOM's employees in the global marketplace.

## COMMITMENT

AECOM is committed to exceptional levels of performance in protecting its people and the environment. As stated in our Core Values, keeping our people safe is our most important measure of success. We strive to be the beacon of safety excellence in the industries and global communities in which we work.

To advance our SH&E program, we are committed to:

- Zero work-related injuries and illnesses to AECOM employees and protection of the environment as a result of our activities.
- Providing a highly effective SH&E management system that drives continual review and improvement.
- Meeting all client requirements and properly incorporating all safety, health and environmental rules and regulations at the local, state, provincial and national levels.
- Developing an exceptional safety culture where our people embrace ownership for the safety of themselves and others.
- Substantial improvements against our goals of pollution prevention, resource conservation and environmental sustainability.
- Setting and meeting aggressive SH&E performance goals and Core Value Metrics to promote continual improvement.
- Working with employees and business partners in order to continuously improve SH&E performance.
- Recognizing and celebrating those who contribute to excellent SH&E performance.
- Striving to make AECOM the provider of choice for the safe execution of design, build, finance, operate and maintenance work globally.

The commitment to this policy by the leadership, management and employees of AECOM provides the foundation for a safe workplace, operational excellence and long-term business success.

## EXPECTATIONS

Safety is a core value and a key to our success. We demand continual improvement in our journey towards a zero incident culture, where everyone is committed to safety, health and environmental excellence.

To that end, we demand that:

- Our leaders, managers, supervisors and employees demonstrate their commitment in their actions and decisions to assure that every person goes home safe every day.
- Our employees embrace safety a core value both on and off the job.
- We have an absolute commitment for our own safety and that of fellow employees.
- We will incorporate all Life-Preserving Principles into our work planning and execution.
- We proactively and aggressively identify, manage and eliminate hazards in the work place.
- We train and prepare our people to have the knowledge, skills, competency and equipment required to work safely.
- We stop our employees from working if the work cannot be executed safely or if conditions or behaviors on the work activity are unsafe.
- All employees immediately report safety, health and/or environmental incidents, near-misses, unsafe conditions, and at-risk behaviors to their supervisor; and that we diligently work to correct the problem.

Our SH&E expectations will be accomplished by the demonstrated leadership of management, implementation, and communications of industry recognized best practices and regulatory compliance.

## COMMUNICATION

This Policy will be reviewed annually to ensure that it meets the needs of the company, and will be made available to all persons under the control of the company.

Sincerely,



Michael S. Burke  
Chief Executive Officer



Date



## **Attachment C**

### **AECOM SH&E Standard Operating Procedures Table of Contents**

Americas

## Safety, Health & Environment Procedures

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#### 000 Series – SH&E Essentials

Procedure #	Topic
S3AM-001-PR	Safe Work Standards & Rules
S3AM-002-PR	Stop Work Authority
S3AM-003-PR	SH&E Training
S3AM-004-PR	Incident Reporting, Notifications & Investigation
S3AM-005-PR	Driving
S3AM-006-PR	Safety Moment
S3AM-007-PR	Behavior-Based Safety
S3AM-008-PR	Fitness for Duty
S3AM-009-PR	Fatigue Management
S3AM-010-PR	Emergency Response Planning
S3AM-011-PR	Fire Protection
S3AM-012-PR	First Aid
S3AM-013-PR	Housekeeping
S3AM-014-PR	Manual Lifting
S3AM-015-PR	Short Service Employees
S3AM-016-PR	Ergonomics
S3AM-017-PR	Injury & Illness Recordkeeping
S3AM-018-PR	Injury & Claims Management
S3AM-019-PR	Substance Abuse Prevention
S3AM-020-PR	Recognition & Rewards

#### 100 Series – Exposure Management

Procedure #	Topic
S3AM-109-PR	Asbestos
S3AM-110-PR	Toxic & Hazardous Substances
S3AM-111-PR	Bloodborne Pathogens
S3AM-112-PR	Cold Stress
S3AM-113-PR	Heat Stress
S3AM-114-PR	Compressed Gases
S3AM-115-PR	Hazardous Materials Communication

S3AM-116-PR	Hazardous Materials Shipping
S3AM-117-PR	Hazardous Waste Operations
S3AM-118-PR	Hearing Conservation
S3AM-119-PR	Laboratories
S3AM-120-PR	Radiation
S3AM-121-PR	Non-Ionizing Radiation
S3AM-122-PR	Gauge Source Radiation
S3AM-123-PR	Respiratory Protection
S3AM-124-PR	High Altitude
S3AM-125-PR	Corrosive & Reactive Materials
S3AM-126-PR	Flammable & Combustible Liquids
S3AM-127-PR	Exposure Monitoring
S3AM-128-PR	Medical Screening & Surveillance

## 200 Series – Planning & Oversight

Procedure #	Topic
S3AM-202-PR	Competent Person Designation
S3AM-204-PR	Environmental Compliance
S3AM-208-PR	Personal Protective Equipment
S3AM-209-PR	Risk Assessment & Management
S3AM-211-PR	Regulatory Inspections
S3AM-213-PR	Subcontractor Management
S3AM-214-PR	International Travel
S3AM-215-PR	Management of Change
S3AM-216-PR	Compliance Assurance

## 300 Series - Field

Procedure #	Topic
S3AM-301-PR	Confined Spaces
S3AM-302-PR	Electrical Safety
S3AM-303-PR	Excavation
S3AM-304-PR	Fall Protection
S3AM-305-PR	Hand & Power Tools
S3AM-306-PR	Highway & Road Work
S3AM-309-PR	Heavy Equipment
S3AM-310-PR	Cranes & Lifting Devices

S3AM-311-PR	Scaffolding
S3AM-312-PR	Ladders
S3AM-313-PR	Wildlife, Plants & Insects
S3AM-314-PR	Working Alone
S3AM-315-PR	Working On & Near Water
S3AM-316-PR	Material Storage
S3AM-317-PR	Hand Safety
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S3AM-319-PR	All-Terrain Vehicles
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S3AM-321-PR	Drilling, Boring & Direct Push Probing
S3AM-322-PR	Overhead Lines
S3AM-323-PR	Aerial Work Platforms
S3AM-324-PR	Powered Industrial Trucks
S3AM-325-PR	Lockout Tagout
S3AM-326-PR	Machine Guarding
S3AM-327-PR	Powder-Actuated Tools
S3AM-328-PR	Process Safety Management
S3AM-329-PR	Railroad Safety
S3AM-330-PR	Underground Work
S3AM-331-PR	Underground Utilities
S3AM-332-PR	Hot Work
S3AM-333-PR	Marine Safety & Vessel Operations
S3AM-334-PR	Diving
S3AM-335-PR	Abrasive Blasting
S3AM-336-PR	Blasting & Explosives
S3AM-337-PR	Compressed Air Systems & Testing
S3AM-338-PR	Concrete
S3AM-339-PR	Demolition
S3AM-340-PR	Steel Erection
S3AM-341-PR	Mine Site Activities
S3AM-342-PR	Temporary Floors, Stairs, Railings & Toeboards
S3AM-343-PR	Hoists, Elevators & Conveyors
S3AM-344-PR	Cofferdams
S3AM-345-PR	Mining Operations
S3AM-346-PR	Signs, Signals & Barricades

## **Attachment D**

### **Hazard Communication Program**



## Hazardous Materials Communication

S3AM-115-PR1

### 1.0 Purpose and Scope

- 1.1 Provides a Hazard Communication Program so that AECOM employees are informed of the hazards of the chemicals to which they may be exposed in the course of their work by way of container labeling and other forms of warning, safety data sheets (SDS), and employee training.
- 1.2 This procedure applies to all AECOM Americas-based employees and operations.
- 1.3 The program applies to the use of any hazardous substances which are known to be present in the workplace in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency.
- 1.4 The program does not apply to general consumer products, for example, cleaners, printer toner, white out, etc.

### 2.0 Terms and Definitions

- 2.1 **Acute Effect** – An adverse effect on the human body with immediate onset of symptoms.
- 2.2 **Article** – A manufactured item: (1) which is formed to a specific shape or design during manufacture; (2) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and, (3) which does not release or otherwise result in exposure to, a hazardous chemical, under normal conditions of use.
- 2.3 **Carcinogen** – Those chemicals appearing in any of the following reference sources are established as carcinogens for hazard communication purposes:
  - National Toxicology Program (NTP) Annual Report on Carcinogens.
  - International Agency for Research on Cancer (IARC) Monographs, Volumes 1-34. Note: The Registry of Toxic Effects of Chemical Substances published by NIOSH indicates whether a substance has been found by NTP or IARC to be a potential carcinogen.
- 2.4 **Chemical Name** – The scientific designation of a substance in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry or the system developed by the Chemical Abstracts Service.
- 2.5 **Chronic Effect** – An adverse effect on the human body with symptoms which develop slowly over a long period of time or which frequently recur.
- 2.6 **Combustible Liquid** – Any liquid having a flash point at or above 100°F (37.8°C) but below 200°F (93.3°C), except any mixture having components with flash points of 200°F (93.3°C), or higher, the total volume of which makes up 99% or more of the total volume of the mixture.
- 2.7 **Common Name** – Any designation or identification such as code name, code number, trade name or brand name used to identify a substance other than by its chemical name.
- 2.8 **Container** – Any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank or the like that contains a hazardous chemical. For purposes of this procedure, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle are not considered to be containers.
- 2.9 **Location** – Any separate and distinct AECOM office, laboratory or other company facility.
- 2.10 **Exposure** – Any situation arising from work operations where an employee may ingest, inhale, absorb through the skin or eyes or otherwise come into contact with a hazardous substance.
- 2.11 **Flammable** – A substance that falls into one of the following categories:

- 2.11.1 **Flammable Aerosol** – An aerosol that when tested by the method described in 16 CFR 1500.45, yields a flame projection exceeding 18 inches at full valve opening or flashback (a flame extending back to the valve) at any degree of valve opening.
- 2.11.2 **Flammable Gas** – A gas that at ambient temperature and pressure:
- Forms a flammable mixture with air at a concentration of 13% of volume or less; or
  - Forms a range of flammable mixtures with air wider than 12% by volume, regardless of the lower limit.
- 2.11.3 **Flammable Liquid** – Any liquid having a flash point below 100°F (37.8°C), except any mixture having components with flash points of 100°F (37.8°C) or higher, the total of which make up 99% or more of the total volume of the mixture.
- 2.11.4 **Flammable Solid** – A solid, including a powdered, granular or pasty mixture of a substance that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change or retained heat from manufacturing or processing or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard.
- Flammable Solids do not include blasting agents or explosives as defined in 8 CCR 5237(a).
- 2.12 **Flash Point** – Minimum temperature of a liquid at which it gives off sufficient vapors to form an ignitable mixture with the air near the surface of the liquid or within the container used.
- 2.13 **GHS** – The Globally Harmonized System of Classification and Labelling of Chemicals developed by the United Nations with the goal of an international system to define and classify the hazards of chemical products, and communicate health and safety information on labels and safety data sheets.
- 2.14 **Hazardous Chemical** – Those chemicals appearing in any of the following reference sources are established as hazardous chemicals for hazard communication purposes.
- 29 CFR Part 1910, Subpart Z, Toxic and Hazardous Substances, OSHA.
  - Hazardous Products Act, R.C.S. 1985, c. H-3, section 2, Canada.
  - For operations within the state of California, the list of hazardous substances prepared by the California Director of Industrial Relations pursuant to Labor Code Section 6382. The concentrations and footnotes, which are applicable to the list, shall be understood to modify the same substance on all other source lists or hazard determinations set forth in § 8 CCR 5194(d)(3)(B) and (d)(5)(D).
- 2.15 **Hazardous Substance** – A hazardous chemical or carcinogen, or a product or mixture containing a hazardous chemical or carcinogen provided that:
- 2.15.1 The hazardous chemical is 1% or more of the mixture or product or 2% if the hazardous chemical exists as an impurity in the mixture; or
- 2.15.2 The carcinogen is 0.1% or more of the mixture or product;
- 2.15.3 Manufacturers, importers and distributors will be relied upon to perform the appropriate hazard determination for the substances they produce or sell.
- 2.15.4 The following materials are not covered by the Hazard Communication Standard:
- Any hazardous waste as defined by the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 USC 6901 et seq.) when subject to regulations issued under that act by the Environmental Protection Agency.
  - Tobacco or tobacco products;
  - Wood or wood products. Note: Wood dust is not exempt since the hazards of wood dust are not “self-evident” as are the hazards of wood or wood products;
  - Consumer products (including pens, pencils, adhesive tape) used in the work place under typical consumer usage;
  - Articles (i.e. plastic chairs);

- Foods, drugs, or cosmetics intended for personal consumption by employees while in the work place;
- Foods, drugs, cosmetics in retail store packaged for retail sale; and
- Any drug in solid form used for direct administration to the patient (i.e., tablets or pills).

**Hazardous substance shall be considered the equivalent term to 'controlled substance'.**

- 2.16 **Hazardous Substance Inventory (HSI) / WHMIS Log** – A listing of all chemicals stored or used at an office or project site. Note that the list may be imbedded in a project Health and Safety Plan.
- 2.17 **Immediate Use** – Means that the hazardous chemical will be under the control of and used only by the person who transfers it from a labeled container and only within the work shift in which it is transferred.
- 2.18 **National Fire Protection Association (NFPA)** – The NFPA is a trade association that issues standards and codes concerning risks associated with fire. A system of categories has been established by NFPA standard 704; colors and numbers, to provide basic hazard information concerning hazardous materials. It enables firefighters and other emergency personnel to easily decide whether or not to evacuate an area or proceed with emergency control operations. The three principal categories of identification are Health, Flammability and Instability. A numerical range of "0 to 4" indicates the severity of the hazard. A "4" indicates the most severe and a "0" indicates a minimal hazard. Refer to *S3AM-115-ATT1 Pictograms & Sample Labels* for an example.
- 2.19 **Mixture** – Any solution or intimate admixture of two or more substances which do not react chemically with each other.
- 2.20 **Reactivity** – A measure of the tendency of a substance to undergo chemical reaction with the release of energy.
- 2.21 **SDS** – A Safety Data Sheet prepared pursuant to state and federal regulations, OSHA Form 174 and Canada regulations (Controlled Products regulations, schedule 1).
- 2.22 **SDS Administrator** – The individual or group designated by the Office Manager (Operations) or Project Manager to maintain the location-specific inventory list or log and the SDS binder required if that location uses or stores hazardous substances.
- 2.23 **Solubility** – The ability of substance to blend and mix uniformly with another.
- 2.24 **Specific Gravity (density)** – Ratio of the weight of a substance to the weight of the same volume of another substance. As used in this directive, specific gravity or density refers to the weight of substance as compared to the weight of an equal volume of water.
- 2.25 **Vapor Density** – The weight of a vapor-air mixture resulting from the vaporization of a volatile liquid at equilibrium temperature and pressure conditions, as compared with the weight of an equal volume of air under the same conditions.
- 2.26 **WHMIS** – The Workplace Hazardous Materials Information System (WHMIS) is Canada's national hazard communication standard. The key elements of the system are cautionary labeling of containers of WHMIS "controlled products", the provision of safety data sheets (SDSs) and worker education and training programs.

### 3.0 References

- 3.1 Additional definitions can be found in the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Hazardous Material Regulations (HMR), the Transportation of Dangerous Goods (TDG) Regulations, and the International Air Transport Association (IATA) Dangerous Goods Regulation (DGR).
- 3.2 S3AM-003-PR1 SH&E Training
- 3.3 S3AM-117-PR1 Hazardous Waste Operations
- 3.4 S3AM-208-PR1 Personal Protective Equipment

### 3.5 S3AM-209-PR1 Risk Assessment & Management

## 4.0 Procedure

### 4.1 Roles and Responsibilities

#### 4.1.1 SH&E Manager / SH&E Department

- Audit their regional offices to confirm that they maintain a location-specific Hazardous Substance Inventory (HSI).
- Audit their regional offices to confirm that if a location-specific HSI is required, that current SDSs are available for each substance listed on the HSI.
- Provide interpretation of SDSs and hazard information for GHS labels/WHMIS labels/NFPA labels and other information to assist in training employees.
- Provide hazard communication training to AECOM employees and file documentation related to this training (e.g. trainer name, date trained, brief description of training, etc.).
- Review SDS for adequacy of completion to meet the OSHA and Canadian standard and returning them to supplier, if necessary.

#### 4.1.2 Manager / Site Safety Officer (SSO) / Supervisor

- Have an operations-specific, written hazard communication program which at least describes how the requirements of this Procedure and the US OSHA and Canadian Hazard Communication requirements for labels and other forms of warning, material safety data sheets, and employee information and training will be met.
- Appoint an SDS administrator for their location if they store or use hazardous substances.
- Confirm, if required, that the SDS Administrator maintains an HSI for their location.
- Confirm that a copy of this Procedure and the site-specific SDS are available to all employees (and/or their designated representative). Employees shall be instructed in the location of this Procedure and the SDSs.
- Confirm that all employees (including new employees) under their supervision have received the appropriate training required by this procedure prior to assigning employees to tasks involving the use of, or potential exposure to, hazardous substances.
- Notify employees of hazardous substances covered by this procedure that are used in their work area.
- Determine the potential fire, toxic, or reactivity hazards which are likely to be encountered in the handling or utilization of a hazardous substance and will communicate this information to their affected employees, before any are permitted to work with it.
- Confirm that a current SDS (is replaced as new versions are issued) is available for each hazardous substance used, or potentially encountered, in the work areas or on the projects that are under their supervision.
- Confirm hazardous substances are properly labelled.
- Notify subcontractors (working for AECOM) of any hazardous substances that are used or stored by AECOM to which the subcontractor's employees may be exposed.
- Notify clients or property owner/operators of chemicals brought onto their property by AECOM or AECOM's subcontractors.
- Request SDSs from all subcontractor organization for the relevant chemicals they bring onto an AECOM controlled site.
- Access or obtain, and maintain copies of SDS from:

- The product manufacturer or supplier;
- All AECOM subcontractors bringing chemicals onto the project site; and
- The client, for all of the client's chemicals to which AECOM or AECOM subcontract employees are potentially exposed.

#### 4.1.3 Employee

- Confirm that they have received appropriate hazard communication training prior to working with materials that fall under the procedure.
- Only work with materials for which they have been instructed on how to find an SDS and how to work with that material safely.
- Utilize the appropriate Personal Protective Equipment (PPE) and spill containment materials as per the SDS.
- Provide a copy of all SDSs received to the SDS Administrator at their facility.
- Verify that an SDS is available in their work area for each hazardous substance that they use.

#### 4.2 General Procedure

- 4.2.1 Confirm that containers of hazardous substances that they use are properly labelled. All employees have a right to, and should, know the properties and potential hazards of substances to which they may be exposed.
- 4.2.2 Should AECOM assign employees that do not read and speak English to tasks with chemical exposures, communications will be provided in the language understood by that employee.

#### 4.3 Employee Information and Training

- 4.3.1 Training of employees on hazardous substances in their work area shall be conducted:
- At the time of their initial assignment;
  - Whenever a new hazardous substance is introduced into their work area; and
  - According to jurisdictional requirements (e.g., GHS, WHMIS, etc.).
- 4.3.2 As a minimum, the training requirements apply to employees in the following job categories:
- All employees who perform field work that involves the use of, shipping / receiving of, or potential exposure to, hazardous substances covered under the OSHA Hazard Communication Standard and WHMIS; and
  - Laboratory Employees.
- 4.3.3 The Initial Training will provide instruction in the following:
- Methods and observations that may be used to detect the presence or release of a hazardous substance in the work area (such as personal monitoring, visual appearance or odor of hazardous substances being released, etc.);
  - The physical and health hazards of substances in the work area and measures and procedures AECOM has implemented to protect employees; and
  - The details of this hazard communication program, including an explanation of the labelling system and the SDS, and how he/she can obtain and use appropriate hazard information;
  - Any operations in their work area in which hazardous substances are present;
  - Location and availability of this written hazard communications program (this procedure);
  - Their right to personally receive information regarding hazardous substances to which they may be exposed;

- Their right to have their physician receive information regarding hazardous substances to which they may be exposed; and
- Any relevant jurisdictional regulation, such as an employee's right against discharge or other discrimination (in California) due to the employee's exercise of rights afforded pursuant to provisions of the California Hazardous Substances Information and Training Act.

#### 4.3.4 Periodic Training and Training for Non-Routine Tasks

Additional training will be provided to employees who have received initial training whenever:

- A new hazardous substance is introduced into their work area;
- A new or significantly increased risk has been identified related to an existing hazardous substance (e.g. as identified in an updated SDS); and
- Non-routine tasks are performed, which will potentially result in exposure to hazardous substances, or exposure under circumstances, which were not addressed during initial training.

Supervisors, in coordination with their SH&E Manager, shall provide such training through an explanation of the information on the contents of the SDS for that substance.

When training their employees, supervisors shall explain:

- Any health hazards associated with use of the substance or mixture;
- Proper precautions for handling;
- Necessary personal protective equipment or other safety precautions to prevent or minimize exposure; and
- Emergency procedures for spills, fire, disposal, and first aid.

For most projects involving field work, this periodic training requirement will be facilitated through the implementation of the site specific SH&E Plan that has been developed for the project.

#### 4.3.5 Documentation of Initial and Periodic Training

- All training required shall be documented at the time it is performed by having the employee sign a copy of a training attendance sheet.

### 4.4 Hazardous Waste Exemption

- #### 4.4.1
- In the U.S., hazardous wastes are excluded from the state and federal Hazard Communication standards. AECOM employees who handle or are otherwise exposed to hazardous wastes are covered by the requirements of the Resource Conservation and Recovery Act (RCRA) and other local waste related laws and regulations and the OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) standard at 29 CFR 1910.120 and *S3AM-117-PR1 Hazardous Waste Operations*.

### 4.5 Hazardous Substance Inventory and Chemical Usage

Establishment of a Specific Hazardous Substance Inventory (HSI) or WHMIS Log, as referenced or contained within the safe to work plan, refer *S3AM-209-PR1 Risk Assessment & Management*, shall include:

- #### 4.5.1
- If an AECOM location uses or stores additional hazardous substances, a location-specific HSI or WHMIS Log shall be maintained at that location.
- #### 4.5.2
- If it is determined that an office-specific HSI is needed, the Manager shall confirm that one is developed and maintained by someone appointed as the location's SDS Administrator.
- #### 4.5.3
- The HSI or WHMIS Log may be hard copy or managed through an electronic SDS management system.

- 4.5.4 The content of the HSI or WHMIS Log shall be updated as new hazardous substances are procured for, or removed from the location, and shall be verified by the SH&E Manager through regular inspections of the location.
- 4.5.5 In order to meet the 30-years-after-employment-termination record retention requirement, the office or project specific HSIs shall be managed as a permanent record.

Prior to using any chemical, a Task Hazard Analysis (THA) shall be completed by the employees assigned to use the chemical. The analysis will identify the hazards associated with the chemical (e.g. review the SDS to identify carcinogens or extremely hazardous chemicals), the tasks to be performed, and prescribe the Personal Protective Equipment (PPE) to be used, refer to *S3AM-208-PR1 Personal Protective Equipment*.

#### 4.6 Safety Data Sheets (SDS)

##### 4.6.1 Location-Specific SDS Inventory

- If it is determined that an AECOM location is required to maintain a location-specific inventory SDSs for the specific hazardous substances shall be maintained on file at that location.
- The SH&E Manager shall audit the local office or project for SDS request and maintenance and report deficiencies to the appropriate management level, as necessary, to confirm compliance with this procedure.

##### 4.6.2 Field Project Sites and Client Facilities

- The Project Manager and/or the Site Safety Officer shall access or obtain, and maintain copies of SDS from:
  - The product manufacturer or supplier;
  - All AECOM subcontractors bringing chemicals onto the project site; and
  - The client, for all of the client's chemicals to which AECOM or AECOM subcontract employees are potentially exposed.

##### 4.6.3 Employee Access to SDSs

SDSs should be maintained at the local location that uses that hazardous substance. Copies of this program and the SDS should be made available to the employee upon request to the office's SDS Administrator.

##### 4.6.4 Field Access to SDSs

When hazardous substances are brought into the field, the user shall confirm that a copy of the SDS for that substance accompanies it and is available at the field location where it is to be used.

##### 4.6.5 SDSs for AECOM Products

It is unlikely that AECOM activities would create a chemical for which a new SDS were needed. If such a chemical were created, the SH&E Department shall work with the appropriate operations groups to draft, review, and publish the new SDS.

##### 4.6.6 Content of the SDS:

- Safety Data Sheets, previously referred to as Material Safety Data Sheets, will now require a 16-section format that is essentially the same as the ANSI standard for Hazardous Workplace Chemicals-Hazard Evaluation and Safety Data Sheets and Precautionary Labeling Preparation (ANSI Z400.1 & Z129.1 – 2010).
- Section 1, Identification includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.
- Section 2, Hazard(s) identification includes all information regarding the hazards of the chemical and the appropriate warning information associated with the hazards including classification, signal word, hazard statement, pictograms, and precautionary statement.

- Section 3, Composition/information on ingredients includes information on chemical ingredients; trade secret claims.
- Section 4, First-aid measures includes important symptoms/ effects, acute, delayed; required treatment.
- Section 5, Fire-fighting measures lists suitable extinguishing techniques, equipment; chemical hazards from fire.
- Section 6, Accidental release measures lists emergency procedures; protective equipment; proper methods of containment and cleanup.
- Section 7, Handling and storage lists precautions for safe handling and storage, including incompatibilities.
- Section 8, Exposure controls/personal protection lists OSHA's Permissible Exposure Limits (PELs); Threshold Limit Values (TLVs); appropriate engineering controls; personal protective equipment (PPE).
- Section 9, lists the physical and chemical properties of the hazardous substance.
- Section 10, Stability and reactivity lists chemical stability and possibility of hazardous reactions.
- Section 11, Toxicological information includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.
- Section 12, Ecological information
- Section 13, Disposal considerations
- Section 14, Transport information
- Section 15, Regulatory information
- Section 16, Other information, includes the date of preparation or last revision.

SDSs that do not contain this information shall be returned to the distributor or manufacturer to be updated.

#### 4.6.7 Trade Secrets

Some hazardous substance suppliers may claim the information requested on SDSs is proprietary and not provide the information to AECOM.

When SDSs supplied to the SH&E Manager indicate that proprietary information has been withheld, the SH&E Manager will either obtain the necessary information to make a hazard assessment or reject the material for use within AECOM.

#### 4.6.8 For Canadian operations, all relevant SDS shall be current (no more than 3 years old) and readily available (in French and English) for all hazardous materials.

### 4.7 Labeling

#### 4.7.1 Containers of hazardous substances used or stored in each AECOM location shall be labeled, tagged or marked with the following information:

- Product name or Identifier;
- Hazard Pictogram;
- Signal Word;
- Physical, Health, Environmental Statements;
- Supplemental Information;
- Precautionary Measures and Pictograms;



- First Aid Statements;
- Name and Address of Company; and
- Telephone Number.

4.7.2 Refer to *S3AM-115-ATT1 Pictograms & Sample Labels*.

4.7.3 Labels on containers shall not be removed or defaced. Labels or other forms of warning shall be legible, in English and French (Canada), and prominently displayed on the container.

4.7.4 Formal and informal inspections shall include observing that hazardous materials are properly labeled.

4.7.5 Immediately replace lost or illegible labels provided the product can be conclusively identified. Any failure to have the appropriate labeling information on a container at any time, or illegible or missing labels will be cause to suspend use of the product until the product is conclusively identified and is properly labeled.

#### 4.7.6 Carcinogen Labeling

Chemicals which have been indicated as positive or suspect carcinogens by either OSHA, ACGIH, the International Agency for Research on Cancer (IARC) (World Health Organization), or the National Toxicology Program (NTP) will be considered to be carcinogenic for purpose of the HCS.

#### 4.7.7 Stationary Process Containers

If there is stationary process equipment within a work area, signs, placards, pictograms, process sheets, batch tickets, operating procedures, or other such written materials may be used in lieu of fixed labels on the containers, as long as the alternative method conveys the appropriate hazard information. The written materials shall be readily accessible to the employees in the work area.

#### 4.7.8 Portable Containers

Portable containers of hazardous substances need not be labelled when the substance is transferred from labelled containers and will be used immediately by the employee who performs the transfer, however the container shall still contain the product identifier (name). Immediate use means the container will remain in the employee's immediate possession and direct oversight until the container is fully emptied or contents are returned to a labelled container.

Containers of hazardous substances transferred from labelled containers and not intended for the immediate use of the employee performing the transfer shall be labelled with the chemical name and a hazard warning label meeting workplace label requirements in accordance with the OSHA Hazard Communication Standard or WHMIS (as applicable to the given jurisdiction).

### 4.8 Chemical Storage

4.8.1 Hazardous chemicals are to be stored in labeled containers with the lids securely closed using appropriate undamaged caps or lids. Confirm liners are in place if used.

4.8.2 Flammable and combustible materials shall be stored in fire impervious cabinets in designated stockroom areas. Chemicals shall be stored in compliance with instructions provided on their labels, SDS, or the manufacturer's specifications (e.g. compatibility with other substances, environmental conditions, etc.).

NOTE: Flammable gases or other compressed gases should not be stored in flammable material cabinets as these cabinets are not designed for containment of pressurized gases.

4.8.3 All hazardous chemicals shall be stored in a manner that prevents spillage and leakage from exposing people or the environment to the chemical.

4.8.4 Hazardous chemicals shall not be stored with foods or beverages. Food and beverages shall not be consumed in areas where hazardous chemicals are used or stored.

#### 4.9 Chemical Use in Offices

4.9.1 In general, hazardous substances should not be taken into office areas, conference rooms, or break areas, contact the SH&E Manager for guidance if this general requirement is infeasible.

4.9.2 General exceptions to this rule are the following:

- Liquid paper;
- Toner;
- Cleaners;
- Isobutylene calibration gas; and
- pH calibration solutions for instruments.

4.9.3 Each office or location using or storing hazardous materials will develop a written office/ location-specific Hazard Communication/WHMIS Program.

4.9.4 If the local office decides to implement the requirements of the standard in any way that differs from this procedure, they shall verify the changes with the SH&E Manager, document the changes, and communicate the differences to all affected employees.

#### 4.10 Canada-specific

4.10.1 Consumer products are exempt from supplier labels and SDS requirements. Some cleaning solvents may be packaged as consumer products and these shall be labeled in accordance with the Consumer Product Act requirements.

4.10.2 In addition to the labelling of storage containers in the workplace, the contents of process piping (including valves), process vessels and reaction vessels are required to be identified through the use of colour coding, labels, placards or other modes of identifications that shall be communicated to workers through training programs. It is important for employees to be aware of and understand Client labelling requirements for these types of process systems.

### 5.0 Records

5.1 HSI or WHMIS Logs shall be retained in project or office files for a minimum of 30 years or according to jurisdictional requirements.

5.2 Training documentation shall be retained in accordance with *S3AM-003-PR SH&E Training*.

### 6.0 Attachments

6.1 S3AM-115-ATT1 Pictograms & Sample Labels



## **Attachment E**

### **Respiratory Protection Plan**

## Respiratory Protection

S3AM-123-PR1

### 1.0 Purpose and Scope

- 1.1 This procedure establishes a written respiratory protection program with the required elements and work site-specific procedures for respirator selection, use, and maintenance for any workplace where respirators are necessary to protect the health of an Employee.
- 1.2 The primary objective shall be to prevent exposure to atmospheric contaminants as far as feasible by accepted engineering control measures (e.g. enclosure or confinement of the operation, general and local exhaust ventilation [LEV], and substitution of less toxic materials). If respiratory hazards remain, suitable administrative controls and respiratory protective equipment requirements shall be established.
- 1.3 This procedure applies to all AECOM Americas-based employees and operations, except where local or governmental regulations are more stringent.

### 2.0 Terms and Definitions

- 2.1 **Action Level (AL)** – An airborne concentration of a potentially toxic or hazardous substance, measured in parts per million by volume (ppm), microgram per cubic meter ( $\mu\text{g}/\text{m}^3$ ) milligram per cubic meter ( $\text{mg}/\text{m}^3$ ) or fibres per cubic centimetre (f/cc), that triggers certain provisions as required by the applicable jurisdictional legislation. In many cases the action level is 50% of the established exposure limit.
- 2.2 **Air-purifying respirator** – A respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.
- 2.3 **Approved** – Equipment tested and listed by the Bureau of Mines, jointly by the Mining Enforcement and Safety Administration (MESA), and the National Institute for Occupational Safety and Health (NIOSH), or jointly by the Mine Safety and Health Administration (MSHA) and NIOSH. Please note Canadian Standards Association (CSA) bases respirator selection on NIOSH criteria for the testing and certification of respirators.
- 2.4 **Assigned protection factor (APF)** – The ratio of the ambient concentration of an airborne substance (outside the respirator) to the concentration of the substance inside the respirator.
- 2.5 **Atmosphere-supplying respirator** – A respirator that supplies the user with breathing air from a source independent of the ambient atmosphere, including supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units.
- 2.6 **Breakthrough** – The first perception of an odor, taste or irritation experienced while wearing an air-purifying respirator. Breakthrough is generally an indication that the cartridges are saturated and are no longer filtering out the contaminant. Breakthrough can also be an indication of an improperly functioning respirator.
- 2.7 **Established Exposure Limit** – The maximum regulatory exposure concentration to which an individual may be exposed to for an 8- hour time weighted average (TWA).
  - This limit is referred to by different terminology depending upon the given jurisdiction (e.g. Permissible Exposure Limit (PEL), Contamination Limit, Occupational Exposure Limit (OEL), Threshold Limit Value (TLV), etc.).
  - Acceptable methods of adjusting this limit to correspond to a different exposure period (e.g. 10 hours) vary by jurisdiction and substance.
- 2.8 **Filtering facepiece (dust mask)** – A negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.
- 2.9 **Fit factor** – A quantitative estimate of the fit of a particular respirator to a specific individual, typically estimating the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

- 2.10 **Fit test** – The use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual. (See also Qualitative fit test [QLFT] and Quantitative fit test [QNFT].)
- 2.11 **Hazardous atmosphere** – Any atmosphere, either immediately or not immediately dangerous to life or health, that is oxygen-deficient or that contains a toxic or disease-producing contaminant exceeding the legally established permissible exposure limit or, where applicable, the Threshold Limit Value established by the American Conference of Governmental Industrial Hygienists.
- 2.12 **Immediately dangerous to life or health (IDLH)** – An atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.
- 2.13 **Maximum use concentration (MUC)** – The maximum concentration of an airborne contaminant from which an employee is expected to be protected when wearing a respirator, determined by the assigned protection factor of the respirator or class of respirators and the occupational exposure limit for that contaminant. The MUC is usually determined mathematically by multiplying the assigned protection factor (APF) specified for a respirator by the established exposure limit, which can include a short-term exposure limit and a ceiling limit or any other exposure limit used for that chemical agent, as defined by the authority having jurisdiction.  
  
MUC = APF x established exposure limit
- 2.14 **Negative pressure respirator (tight fitting)** – A respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.
- 2.15 **Oxygen-deficient atmosphere** – An atmosphere with oxygen content below 19.5 percent by volume.
- 2.16 **Physician or other licensed health care professional (PLHCP)** – An individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide or be delegated the responsibility to provide some or all of the health care services required by local or governmental respiratory protection standards.
- 2.17 **Positive pressure respirator** – A respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.
- 2.18 **Powered air-purifying respirator (PAPR)** – An air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.
- 2.19 **Pressure demand respirator** – A positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.
- 2.20 **Qualitative fit test (QLFT)** – A pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.
- 2.21 **Quantitative fit test (QNFT)** – An assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.
- 2.22 **Self-contained breathing apparatus (SCBA)** – An atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.
- 2.23 **Supplied-air respirator (SAR) or airline respirator** – An atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.
- 2.24 **Tight-fitting facepiece** – A respiratory inlet covering that forms a complete seal with the face.
- 2.25 **User seal check** – An action conducted by the respirator user to determine if the respirator is properly sealed to the face.

### 3.0 References

- 3.1 S3AM-003-PR1 SH&E Training
- 3.2 S3AM-114-PR1 Compressed Gases

### 3.3 S3AM-128-PR1 Medical Screening & Surveillance

## 4.0 Procedure

### 4.1 Roles and Responsibilities

#### 4.1.1 Respiratory Protection Program Administrator

The Respiratory Protection Program Administrator will be established at each project/location where employees are required to wear respirators. The Respiratory Protection Program Administrator will:

- Verify full compliance with this procedure.
- Assist with the arranging of any required medical evaluations or any other additional medical attention related to the use of a respirator.
- Perform or arrange suitable providers to perform the program evaluations described in this procedure.
- Maintain required inspections and testing/certifications of SCBA units

#### 4.1.2 Manager /Supervisor

- Verify compliance with the respiratory protection program set forth in this procedure.
- Verify that only those employees who are medically qualified, properly trained, and fit tested are assigned to respirator work.
- Verify that respirators are provided, repaired, or replaced as may be required due to wear and deterioration.
- Confirm that the emergency rescue service is available to respond prior to any employees entering the IDLH area.

#### 4.1.3 SH&E Manager (or designee)

- Monitor compliance with the various aspects of this program.
- Provide technical assistance regarding respirator selection and use, evaluate the effectiveness of this program, and support respirator training and fit testing (e.g. determine cartridge change out schedule for negative air respirators).
- Audit company compliance with this procedure.

#### 4.1.4 Employee

- Use respiratory protection in accordance with instructions and training received.
- Maintain the respirator in accordance with this procedure and the manufacturer's instructions.
- Immediately report any malfunction of the respirator to the Supervisor or Manager or other responsible person.
- For employees who wish to wear respirators on a voluntary basis when not required to by AECOM or a regulatory agency, the employee shall complete *S3AM-123-FM2 – Voluntary Use of Respirators* or an equivalent form.

### 4.2 Training

4.2.1 Employees who wear respiratory protection shall receive training before they are assigned to a task that requires the use of respiratory protection.

4.2.2 Employees that may be exposed to a respiratory hazard will be instructed on the hazard and the controls prior to beginning work.

- 4.2.3 Atmospheric testing will be carried out by qualified personnel trained in the use, calibration, and interpretation of the test equipment.
- 4.2.4 Retraining shall be administered annually, and when the following situations occur:
- Changes in the workplace or the type of respirator render previous training obsolete;
  - Inadequacies in the Employee's knowledge or use of the respirator indicate that the Employee has not retained the requisite understanding or skill; or
  - Any other situation arises in which retraining appears necessary to verify safe respirator use.

4.2.5 Basic Respirator Training Program

Respirator training classes will include, at a minimum, the following:

- Instruction in the nature of the respiratory hazards, whether acute, chronic, or both, and a description of potential health effects if the respirators are not used;
- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;
- The limitations and capabilities of the respirator;
- Proper fitting, including demonstrations and practice in wearing, adjusting, determining the fit of, and performing a user seal check each time respirator is donned. Refer to *S3AM-123-ATT1 Fit Testing Protocol*, *S3AM-123-FM1 Respiratory Equipment Fit Test* and *S3AM-123-ATT2 User Seal Check*;
- How to inspect, put on, use and remove the respirator;
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;
- The procedures for maintenance and storage of the respirator;
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and
- The general requirements of local or governmental Respiratory Protection Standards.

4.3 Medical Surveillance

- 4.3.1 No Employee shall be assigned to a task that requires the use of a respirator unless it has been determined that he/she is physically able to perform the work while using the required respirator.
- 4.3.2 Prior to wearing a respirator and in accordance with the applicable jurisdictional requirements, Employees shall complete medical screening to identify any relevant psychological or physiological impediments to respiratory protection use. Screening may require an initial baseline medical surveillance examination, based on jurisdictional requirements or screening results, performed by a PLHCP in accordance with the requirements of *S3AM-128-PR1 Medical Screening & Surveillance Program*.
- 4.3.3 Additional medical examinations will be provided to employees who wear respirators when:
- An Employee reports medical signs or symptoms that are related to ability to use a respirator;
  - A PLHCP, Supervisor, or the Respiratory Protection Program Administrator determines that an Employee needs to be reevaluated;
  - Information from the Respiratory Protection Program, including observations made during fit testing and program evaluation, indicates a need for Employee reevaluation; or
  - A change occurs in workplace conditions (e.g., physical work effort, protective clothing, temperature, etc.) that may result in a substantial increase in the physiological burden placed on an Employee.



- 4.3.4 All medical surveillance examinations shall be at no cost to the employee and occur during normal working hours; shall be convenient, understandable, and confidential; and the Employee will be given the chance to discuss results with examining physician.

#### 4.4 Respirator Selection

- 4.4.1 The location or project specific SH&E Plan shall identify applicable respiratory hazards and develop appropriate controls, which may include respiratory protection. If respiratory protection is necessary the SH&E Plan shall detail the requirements.
- 4.4.2 SH&E Managers or his/her designated representative shall select and provide an appropriate respirator based on:
- The respiratory hazard(s) to which the employee may be exposed, including oxygen deficiency. Identify potential contaminants, concentrations, and the physical state of airborne contaminants:
    - Particulates (dust, fibers, micro-organisms, smoke, fumes).
      - Indicate the presence of any oil in particulate hazards. (may be produced by motor vehicles, air compressor systems using oil lubricators) If unknown, oil shall be assumed to be present.
    - Vapor and gases
      - Gases which may produce an oxygen deficiency (i.e. helium, argon, carbon monoxide and nitrogen).
      - Gases which are acids or produce acids when in contact with moisture (i.e. sulphur oxides, carbon dioxide, hydrogen chloride).
      - Gases which are alkaline or produce alkalis in reaction with moisture (i.e. ammonia, amines, phosphine).
      - True gases or vapors from evaporation of organic liquids (i.e. acetone, toluene, benzene).
      - Metal reacted with an organic compound (i.e. tetra-ethyl lead: was used in leaded fuel and still in aviation fuel, organic phosphates).
      - Mercury vapor.
      - Radon.
  - The eye and face hazards to which the employee may be exposed (absorption, irritant, impact).
  - Workplace or user factors that may affect respirator performance and reliability.
- 4.4.3 SH&E Managers or his/her designated representative shall identify and evaluate the respiratory hazard(s) in the workplace. Evaluations shall include a reasonable estimate of employee exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form.
- 4.4.4 Respiratory protection is required for those operations in which engineering controls or work practice controls are not feasible to reduce toxic or hazardous substance exposure at or below the AL (or if applicable, established exposure limit).
- 4.4.5 Where the employee exposure cannot be identified or reasonably estimated, the atmosphere shall be considered IDLH.
- 4.4.6 Only approved respirators shall be selected and they shall be used in compliance with the conditions of their certification.

- 4.4.7 Respirators shall be selected from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.
- 4.5 Fit Testing Procedures
- 4.5.1 After the medical assessment is complete, employees using a tight-fitting respirator shall pass an appropriate QLFT or QNFT prior to initial use of the respirator, whenever a different respirator facepiece (size, style, model or make) is used, and at least annually (or as required by the applicable jurisdiction) thereafter. Refer to *S3AM-123-ATT1 Fit Testing Protocol*.
- 4.5.2 Fit testing shall be performed using the same make, model, style and size of respirator the user would be expected to use.
- 4.5.3 Should the fit test fail, alternative makes, models, styles and sizes shall be tested to find a correct fit for the user.
- 4.5.4 Respiratory protective equipment shall not be used unless a satisfactory fit test has been achieved for that particular equipment.
- 4.5.5 Fit testing shall also verify user competency in donning, doffing, inspecting and performing of seal checks.
- 4.5.6 Additional fit tests will be performed:
- Whenever there is an indication that changes in the Employee's physical condition might have an effect on respirator fit (such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight);
  - If the Employee notifies his/her Supervisor or SH&E Manager that the fit of his/her respirator is unacceptable.
- 4.6 Interference with Facepiece Seal
- 4.6.1 AECOM shall not permit respirators with tight-fitting facepieces to be worn by Employees who have:
- Facial hair that comes between the sealing surface of the facepiece and the face or that interferes with valve function; or
  - Any condition that interferes with the face-to-facepiece seal or valve function.
- 4.6.2 If an employee wears corrective glasses or goggles or other personal protective equipment, the Supervisor or Manager shall confirm that such equipment is worn in a manner that does not interfere with the seal of the facepiece to the face of the user.
- 4.6.3 Employees shall perform a user seal check each time they don the respirator. Refer to *S3AM-123-ATT2 User Seal Check Procedures*.
- 4.7 Specification of Proper Level of Respiratory Protection
- 4.7.1 The SH&E Manager or his/her designated and qualified representative shall provide guidance on the proper selection and use of all respiratory protective devices, including half-face and full-face air purifying respirators, airline respirators, and self-contained breathing apparatus. This information is generally specified as part of the written site-specific SH&E plan and Task Hazard Assessment (THA).
- 4.7.2 Employees engaged in activities not covered by a THA or SH&E plan shall stop work and consult with the SH&E Manager or his/her designated representative to determine the proper equipment to use prior to resuming activities. Whenever appropriate, exposure levels will be measured to verify that the actual use conditions are within the limitations of the approvals specified by NIOSH/MSHA for the selected respirator.

## 4.8 Cartridges

### 4.8.1 NIOSH certifies three classes of filters\*:

Three categories of resistance to filter efficiency degradation:	Three levels of filter efficiency:
N ( <b>N</b> ot resistant to oil)	95% (called "95")
R ( <b>R</b> esistant to oil)	99% (called "99")
P (oil <b>P</b> roof)	99.97% (called "100")

\*Filters are available in any combination of the above.

### 4.8.2 Generally cartridge color denotes the type of contaminant the cartridge was designed to filter:

Olive:	Multi-contaminant
White:	Acid gas
Black:	Organic vapors
Green:	Ammonia gas
Yellow:	Acid gas and organic vapors
Blue:	Carbon Monoxide
Purple (Magenta):	Radioactive material, except tritium & noble gases
Purple:	Any particulates - P100
Orange:	Any particulates - P95, P99, R95, R99, R100
Teal:	Any particulates free of oil - N95, N99, or N100

Please note; this is only a basic listing and should only be used as a reference. Combinations, deviations or additional types may be encountered. To ensure proper cartridge selection consult the cartridge supplier to ensure applicability to the contaminant(s) anticipated

- 4.8.3 Filter cartridges shall be changed out whenever an increase in breathing resistance is detected by the user.
- 4.8.4 When available, chemical cartridges that are equipped with end-of-service life indicators (ESLI) shall be utilized. In those cases, cartridges should be changed when indicated by the ESLI. A buddy system should be used so coworkers can monitor each other's cartridge color condition.
- 4.8.5 In the absence of cartridges equipped with an ESLI, employees shall change chemical cartridges on the following schedule:
- Immediately if breakthrough is perceived or if resistance to breathing is detected by the user; and
  - In accordance with the change out schedule based upon the anticipated contaminant concentration, environmental conditions, employee work rate, and the specific data provided by manufacturer.
- 4.8.6 When PAPRs are worn, the same rules apply with the exception that filter cartridges should be changed when airflow through the filter elements decreases to an unacceptable level, as indicated by the manufacturer's test device.

#### 4.9 Air-Supplying Respirator Use

4.9.1 Air-supplying respirators will be specified for use when it has been determined that any of the following conditions exist:

- The oxygen concentration is less than 19.5 percent;
- The contaminant is unknown or its concentration cannot be quantified;
- The airborne contaminant concentration is above its IDLH;
- An air-purifying respirator canister or cartridge that removes the contaminant is not available;
- The contaminant concentration is above the concentration for which an air-purifying canister or cartridge is approved; or
- The contaminant concentration is above the MUC of a full-face air-purifying respirator.

4.9.2 No Employee may engage in an operation requiring the use of an air-supplied respirator unless the SH&E Manager or his/her designated representative has reviewed the operation and approved its use.

4.9.3 The determination of the type of air-supplying respirator (i.e., SCBA, airline, demand, pressure demand, etc.) appropriate for the job, outside standby persons, communication, proper training and equipment, notification procedures, and necessary action should be part of the THA or SH&E Plan. Mandatory equipment including SCBA or SAR with auxiliary air supply and emergency appropriate retrieval equipment or equivalent rescue means shall be made by the SH&E Manager or his/her designated representative at the time of the THA or SH&E Plan review. The need for any additional precautions (i.e., equipment specific training, on-site health and safety support, etc.) shall also be determined by the SH&E Manager or his/her designated representative.

#### 4.10 Minimum Procedures for IDLH Atmospheres

4.10.1 One Employee or, when needed, more than one Employee shall be located outside the IDLH atmosphere. This employee shall be responsible for communicating with the Employees in the IDLH atmosphere, alerting rescue services if needed, and restricting entrance to the IDLH area by untrained and unapproved persons.

4.10.2 Visual, voice, or signal line communication shall be maintained between the Employee(s) in the IDLH atmosphere and the employee(s) located outside the IDLH atmosphere.

4.10.3 The Employee(s) located outside the IDLH atmosphere shall be trained and equipped to provide effective emergency rescue or to initiate on-site rescue services.

4.10.4 If on-site rescue services are to be used, the Manager or Supervisor shall confirm that the service is available to respond prior to any employees entering the IDLH area.

4.10.5 Employee(s) located outside the IDLH area and/or on-site rescue services shall be equipped with:

- Pressure demand or other positive pressure SCBAs, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA; and either
- Appropriate retrieval equipment for removing the employee(s) who enter(s) these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry; or
- Equivalent means for rescue where retrieval equipment would create a hazard to the Employees in the IDLH area.

#### 4.11 Breathing Air

4.11.1 Compressed air used for respiration shall be of high purity and shall meet, as a minimum, the requirements of the specification for Grade D breathing air as described in Compressed Gas Association Specification G-7.1 (ANSI Z86.1).

4.11.2 Oxygen shall NOT be used as a source of breathing air at any time in open-circuit SCBAs or airline respirators.

4.11.3 Compressor Supplied Breathing Air

- All compressors used for filling SCBA air cylinders or for supplying airline respirators shall be equipped with the following safety and standby devices:
  - The compressor intake shall be located to verify that only respirable (uncontaminated) air is admitted. This requires attention to the location of the compressor intake with respect to compressor engine exhaust, chemical storage or use areas, and suitable intake screening or filtration.
  - Alarms to indicate compressor failure (such as low-pressure air horns, etc.) shall be installed in the system.
  - A receiver of sufficient capacity to enable the respirator wearer to exit from a contaminated atmosphere shall be provided.
- If an oil-lubricated compressor is used to supply breathing air, it shall be equipped with both of the following devices:
  - A continuous reading carbon monoxide monitoring system set to alarm should the carbon monoxide concentration exceed 10 parts per million; and,
  - A high temperature alarm which will activate when the discharge air exceeds 110 percent of the normal operating temperature in degrees Fahrenheit.
- An in-line purifying filter assembly to remove oil, condensed water, particulates, odors, and organic vapors shall be used in conjunction with the air compressor.

4.11.4 Compressed Air Cylinder Systems for Airline Respirators

- Compressed air cylinders shall meet the requirements of *S3AM-114-PR1 Compressed Gases*.
- Compressed air cylinder systems used to supply airline respirators shall be equipped with low pressure warning bells (e.g., Scott Pak-Alarm) or similar warning devices to indicate air pressure in the manifold below 500 pounds per square inch (psi). When such systems are used, one employee shall be assigned as safety standby within audible range of the low pressure alarm.
- Airline hose couplings shall be incompatible with outlets for other gas systems to prevent inadvertently supplying airline respirators with non-respirable gases or oxygen.
- The air pressure at the hose connection to airline respiratory equipment shall be within the range specified in the approval of the equipment by the manufacturer.
- Routine inspection and maintenance of the air compressor shall be performed.

4.11.5 Compressed Air Cylinder Systems for Recharging SCBAs

- When a cascade system is used to recharge SCBA air cylinders, it shall be equipped with a high-pressure supply hose and coupling rated at a capacity of at least 3,000 psi.

4.11.6 Escape/Egress Units

- Escape/egress unit respirators are intended for use in areas where escape with a short-term (minimum 5 minutes) air supply is necessary. It is important that escape bottle size be provided that will allow the employee to get to a safe location considering breathing rate and distance.
- Escape bottles are required on air-line respirators used in IDLH and high hazard work conditions.
- They may be used as adjuncts to airline pressure demand respirators as a backup air supply or as independent emergency devices in areas where respiratory protection is not normally required.

- Appropriate training shall be conducted and documented prior to assigning Employees to tasks or locations subject to the use of these respirators.
- Escape/egress units (minimum 5 minutes) shall never be used to enter a hazardous atmosphere or as primary standby respirators for confined space entry.

#### 4.12 Respirator Inspection, Cleaning, Maintenance, and Storage

When respirator use is required, only properly cleaned and maintained NIOSH/MSHA approved respirators shall be used.

##### 4.12.1 Inspection

- Respirators should be inspected before and after use using *S3AM-123-FM3 Respiratory Equipment Inspection*, or equivalent. The respirator should not be used and removed and marked out of service if any item on the checklist fails inspection.
- Respirators for emergency use should be inspected once per month.
- Defects shall be reported to their Supervisor or Manager. No defective respirator shall be issued or worn.

##### 4.12.2 Cleaning and Maintenance

- Respirator facepiece assemblies shall be cleaned and sanitized minimally after each day of use in accordance with the requirements specified in *S3AM-123-ATT3 Respirator Cleaning*.
- The respirator should also be inspected for any damaged parts (repair should only be done by trained personnel with the proper tools).
- Respiratory equipment shall not be passed from one person to another until it has been cleaned and sanitized.
- Respiratory equipment shall be maintained according to manufacturer's instructions.
- In field situations, a pre-moistened towelette (e.g., baby wipes) can be used. The mask should then be rinsed with clean warm water and dried. Towelettes or wipes shall be compatible with the respirator materials.
- Alcohol should never be used to clean masks as it can damage the facepieces and rubber parts.
- Where respirators are assigned to individual employees, management shall verify compliance with cleaning and maintenance requirements by periodic inspection and field audits of respiratory equipment.

##### 4.12.3 Storage

- Store clean respirators so that they are protected from dust, excessive moisture, damaging chemicals, temperature extremes and direct sunlight or UV light. They should be placed in a sealed plastic bag and stored in the original box or similar container which blocks light.

#### 4.13 Hygiene

- ##### 4.13.1
- Employees shall leave the work area to wash, change cartridges, or if they detect breakthrough or resistance.

#### 4.14 Costs

- ##### 4.14.1
- The costs for training, medical examinations, fit testing, respirators, spectacle kits, and cleaning materials should be considered as operational costs.

#### 4.15 Program Evaluation

- ##### 4.15.1
- The SH&E Manager or his/her designated representative shall conduct evaluations of the workplace as necessary to verify that the provisions of the current written program are being effectively implemented and that it continues to be effective.

- 4.15.2 The SH&E Manager shall regularly (i.e., during annual training) consult Employees required to use respirators to assess their views on program effectiveness and to identify any problems. Any problems that are identified during this assessment shall be corrected. Factors to be assessed include but are not limited to:
- Respirator fit (including the ability to use the respirator without interfering with effective workplace performance);
  - Appropriate respirator selection for the hazards to which the Employee is exposed;
  - Proper respirator use under the workplace conditions the Employee encounters; and
  - Proper respirator maintenance.

## **5.0 Records**

- 5.1 Medical records under this section shall be maintained at a minimum in accordance with *S3AM-128-PR1 Medical Screening & Surveillance*.
- 5.2 Fit Test Records shall be maintained in the Employee's health and safety records. *S3AM-123-FM1 Respiratory Equipment Fit Test*, or equivalent, will be used to document each fit test.
- 5.3 Training Records shall be maintained in accordance with *S3AM-003-PR1 SH&E Training*.

## **6.0 Attachments**

- 6.1 [S3AM-123-ATT1](#) [Fit Testing Protocol](#)
- 6.2 [S3AM-123-ATT2](#) [User Seal Check](#)
- 6.3 [S3AM-123-ATT3](#) [Respirator Cleaning](#)
- 6.4 [S3AM-123-FM1](#) [Respiratory Equipment Fit Test](#)
- 6.5 [S3AM-123-FM2](#) [Voluntary Use of Respirators](#)
- 6.6 [S3AM-123-FM3](#) [Respiratory Equipment Inspection](#)
- 6.7

## **Fit Testing Protocol**

S3AM-123-ATT1

### **1.0 Selection**

- 1.1 Fit testing shall not be conducted until after the medical screening and any medical examination is concluded, to confirm there are no relevant psychological or physiological impediments or restrictions to respiratory protection use. A medical examination may result in clearance to use any type of respirator, total restriction for respiratory equipment use, or specific respiratory use restrictions (e.g. powered air-purifying respirator (PAPR) only).
- 1.2 Employees are expected to present themselves for a fit test in the same condition as when using the respiratory protective equipment in their job. These conditions include hair style and whether or not make-up, face creams, glasses, contact lenses, and/or dentures would be used.
- 1.3 Employees shall confirm that no jewelry, head-coverings or other items could interfere with the fit and the face is clean shaven where a tight-fitting respirator is required to seal. Any PPE required to be used concurrently with the RPE that could affect the fit of a tight-fitting facepiece shall be utilized during the fit test.
- 1.4 The Employee shall be allowed to pick the most acceptable respirator from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the Employee.
- 1.5 Prior to the selection process, the Employee shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension, and how to determine an acceptable fit. A mirror shall be available to assist the Employee in evaluating the fit and positioning of the respirator. This instruction may not constitute the Employee's formal training on respirator use, because it is only a review.

### **2.0 Comfort**

- 2.1 The Employee shall be instructed to hold each chosen face piece up to the face and to eliminate those that obviously do not give an acceptable fit.
- 2.2 The more acceptable face pieces are noted in case the one selected proves unacceptable; the most comfortable mask is donned and worn at least 5 minutes to assess comfort.
- 2.3 If the Employee is not familiar with using a particular respirator, he/she shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.
- 2.4 Assessment of comfort shall include a review of the following points with the Employee and allowing he/she adequate time to determine the comfort of the respirator:
  - Position of the mask on the nose;
  - Room for eye protection;
  - Room to talk; and
  - Position of mask on face and cheeks.

### **3.0 Fit Test Criteria**

- 3.1 The following criteria shall be used to help determine the adequacy of the respirator fit:
  - Chin properly placed;
  - Adequate strap tension, not overly tightened;
  - Fit across nose bridge;
  - Respirator of proper size to span distance from nose to chin;



- Tendency of respirator to slip; and
  - Self-observation in mirror to evaluate fit and respirator position.
- 3.2 The test shall not be conducted if there is any hair growth between the skin and the face piece sealing surface, such as stubble beard growth, beard, moustache, or sideburns that cross the respirator sealing surface. Any type of apparel that interferes with a satisfactory fit shall be altered or removed.
- 3.3 Before conducting the negative and positive pressure checks, the Employee shall be told to seat the mask on the face by moving the head from side to side and up and down slowly while taking in a few slow deep breaths. Another face piece shall be selected and retested if the Employee is unable to seat the mask.
- 3.4 The Employee shall conduct a user seal check, either the negative and positive pressure seal checks described in *S3AM-123-ATT2 User Seal Check* or as recommended by the respirator manufacturer that provide equivalent protection to the procedures in *S3AM-123-ATT2 User Seal Check*.
- 3.5 If an Employee exhibits difficulty in breathing or signs of claustrophobia or anxiety during the tests, she or he shall be referred to a physician or other licensed health care professional, as appropriate, to determine whether the Employee can wear a respirator while performing her or his duties.
- 3.6 If the Employee finds the fit of the respirator unacceptable, the Employee shall be given the opportunity to select a different respirator and to be retested.

## 4.0 Test Exercise Regimen

- 4.1 Prior to the commencement of the fit test, the Employee shall be given a description of the fit test and their responsibilities during the test procedure. The description of the process shall include a description of the test exercises that will be performed. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test.
- 4.2 The fit test shall be performed while the Employee is wearing any applicable safety equipment that may be worn during actual respirator use and that could interfere with respirator fit.

## 5.0 General Test Exercises

- 5.1 The following test exercises are to be performed for all fit testing methods prescribed in this procedure, except for the Controlled Negative Pressure (CNP REDON) method. A separate fit testing exercise regimen is contained in the CNP protocol. The Employee shall perform exercises, in the test environment, in the following manner:
- 5.1.1 **Normal breathing.** In a normal standing position, without talking, the Employee shall breathe normally.
- 5.1.2 **Deep breathing.** In a normal standing position, the Employee shall breathe slowly and deeply, taking caution so as not to hyperventilate.
- 5.1.3 **Turning head side to side.** Standing in place, the Employee shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the Employee can inhale at each side.
- 5.1.4 **Moving head up and down.** Standing in place, the Employee shall slowly move his/her head up and down. The Employee shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).
- 5.1.5 **Talking.** The Employee shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The Employee can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.
- Rainbow Passage. "When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch with its path high above and its two ends apparently beyond the

horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.”

- 5.1.6 **Grimace.** The Employee shall grimace by smiling or frowning. (This applies only to QNFT testing; it is not performed for QLFT.)
- 5.1.7 **Bending over.** The Employee shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud-type QNFT or QLFT units that do not permit bending over at the waist.
- 5.1.8 **Normal breathing.** In a normal standing position, without talking, the Employee shall breathe normally (this is the same as the first test).
- 5.2 Each test exercise shall be performed for one minute except for the grimace exercise, which shall be performed for 15 seconds.
- 5.3 The Employee shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried.
- 5.4 The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test and the fit test shall be repeated.

## **6.0 Qualitative Fit Test (QLFT) Protocols**

### **6.1 General**

- 6.1.1 QLFT test methods have been validated only for a fit factor of 100. A tight-fitting respirator operated in air-purifying (negative-pressure) mode can be tested by QLFT methods to validate a maximum APF of 10.
- 6.1.2 The maximum APF that can be applied for all tight-fitting respirators operated in air-purifying (negative-pressure) mode is 10 when fit tested using a QLFT method.
- 6.1.3 AECOM will confirm that persons administering QLFT are able to calibrate equipment and perform tests properly, recognize invalid tests, and confirm that test equipment is in proper working order.
- 6.1.4 AECOM will confirm that that QLFT equipment is kept clean and well maintained so as to operate within the parameters for which it was designed.

### **6.2 Irritant Smoke (Stannic Chloride) Protocol**

- 6.2.1 This QLFT uses a person's response to the irritating chemicals released in the “smoke” produced by a stannic chloride ventilation smoke tube to detect leakage into the respirator.
- 6.2.2 **General Requirements and Precautions**
  - The test conductor has the option of donning an air purifying respirator to protect himself/herself from the test agent.
  - The respirator to be tested shall be equipped with high-efficiency particulate air (HEPA) or P100 series filter(s).
  - Only stannic chloride smoke tubes shall be used for this protocol.
  - No form of test enclosure or hood for the Employee shall be used.
  - The smoke can be irritating to the eyes, lungs, and nasal passages. The test conductor shall take precautions to minimize the Employee's exposure to irritant smoke. Sensitivity varies, and certain individuals may respond to a greater degree to irritant smoke. Care shall be taken when performing the sensitivity screening checks that determine whether the Employee can detect irritant smoke to use only the minimum amount of smoke necessary to elicit a response from the Employee.

- The fit test shall be performed in an area with adequate ventilation to prevent exposure of the person conducting the fit test or the build-up of irritant smoke in the general atmosphere.

#### **6.2.3 Sensitivity Screening Check**

- The Employee to be tested shall demonstrate his or her ability to detect a weak concentration of the irritant smoke.
- The test operator shall break both ends of a ventilation smoke tube containing stannic chloride and attach one end of the smoke tube to a low flow air pump set to deliver 200 milliliters per minute or to an aspirator squeeze bulb. The test operator shall cover the other end of the smoke tube with a short piece of tubing to prevent potential injury from the jagged end of the smoke tube.
- The test operator shall advise the Employee that the smoke can be irritating to the eyes, lungs, and nasal passages and instruct the Employee to keep his/her eyes closed while the test is performed.
- The Employee shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its irritating properties and to determine if he/she can detect the irritating properties of the smoke. The test operator shall carefully direct a small amount of the irritant smoke in the Employee's direction to determine that he/she can detect it.

#### **6.2.4 Irritant Smoke Fit Test Procedure**

- The Employee being fit tested shall don the respirator without assistance, and perform the required user seal check(s).
- The Employee shall be instructed to keep his/her eyes closed.
- The test operator shall direct the stream of irritant smoke from the smoke tube toward the face seal area of the Employee, using the low-flow pump or the squeeze bulb. The test operator shall begin at least 12 inches from the facepiece and move the smoke stream around the whole perimeter of the mask. The operator shall gradually make two more passes around the perimeter of the mask, moving to within 6 inches of the respirator.
- If the Employee being tested has not had an involuntary response and/or has not detected the irritant smoke, proceed with the test exercises.
- The General Test Exercises shall be performed by the Employee while the respirator seal is being continually challenged by the smoke, directed around the perimeter of the respirator at a distance of 6 inches.
- If the Employee being fit tested reports detecting the irritant smoke at any time, the test is failed. The Employee being retested shall repeat the entire sensitivity check and fit test procedure.
- Each Employee passing the irritant smoke test without evidence of a response (involuntary cough, irritation) shall be given a second sensitivity screening check, with the smoke from the same smoke tube used during the fit test, once the respirator has been removed, to determine whether he/she still reacts to the smoke. Failure to evoke a response shall void the fit test.
- If a response is produced during this second sensitivity check, then the fit test is passed.

### **6.3 Isoamyl Acetate (IAA, Banana oil) Protocol**

6.3.1 This protocol is not appropriate to use for the fit testing of particulate respirators. If used to fit test particulate respirators, the respirator shall be equipped with an organic vapor filter.

#### **6.3.2 General Requirements and Precautions**

- As smoke can be irritating to some employees, this test method is preferred to reduce risk of irritation to the employee tested and the person conducting the fit test.

- The screening test shall be conducted in a room separate from the room used for actual fit testing. The two rooms shall be well-ventilated to prevent the odor of IAA from becoming evident in the general room air where testing takes place.
- The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the test is performed, in order to prevent olfactory fatigue in the subject.
- The respirator to be tested shall be equipped with a P100 series filter (for organic vapors).

#### 6.3.3 Sensitivity (Odor threshold) Screening Check

- Odor threshold screening, performed without wearing a respirator, is intended to determine if the individual tested can detect the odor of IAA at low levels.
- Obtain the following supplies required to complete the screening:
  - Three 1 liter glass jars with metal lids
  - Odor-free water (e.g., distilled or spring water) at approximately 25 deg. C (77 deg. F) shall be used for the solutions
- The isoamyl acetate (IAA) (also known as isopentyl acetate) stock solution is prepared by adding 1 ml of pure IAA to 800 ml of odor-free water in a 1 liter jar, closing the lid and shaking for 30 seconds. A new solution shall be prepared at least weekly.
- The odor test solution is prepared in a second jar by placing 0.4 ml of the stock solution into 500 ml of odor-free water using a clean dropper or pipette. The solution shall be shaken for 30 seconds and allowed to stand for two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution shall be used for only one day.
- A test blank shall be prepared in a third jar by adding 500 cc of odor-free water.
- The odor test and test blank jar lids shall be labeled (e.g., 1 and 2) for jar identification. Labels shall be placed on the lids so that they can be peeled off periodically and switched to maintain the integrity of the test.
- The employee shall then be asked to sniff each bottle and indicate which bottle contains an odor.
- If the employee is unable to correctly identify the jar containing the odor test solution, the IAA qualitative fit test shall not be performed.

#### 6.3.4 Isoamyl Acetate (IAA, banana oil) Fit Test Procedure

- The fit test chamber shall be a clear 55-gallon drum liner suspended inverted over a 2-foot diameter frame so that the top of the chamber is about 6 inches above the test subject's head. If no drum liner is available, a similar chamber shall be constructed using plastic sheeting. The inside top center of the chamber shall have a small hook attached.
- After successfully completing the odor threshold test and the positive and negative pressure checks, the employee shall don their respirator prior to moving to the fit testing room. This room shall be separate from the room used for odor threshold screening and respirator selection, and shall be well-ventilated, as by an exhaust fan or lab hood, to prevent general room contamination.
- A copy of the prepared text from which the subject is to read may be taped to the inside of the test chamber or should be provided to the employee to hold.
- Upon entering the test chamber, the employee shall be given a 6-inch by 5-inch piece of paper towel, or other porous, absorbent, single-ply material, folded in half and wetted with 0.75 ml of pure IAA. The test subject shall hang the wet towel on the hook at the top of the chamber. An IAA test swab or ampule may be substituted for the IAA wetted paper towel provided it has been demonstrated that the alternative IAA source will generate an IAA test atmosphere with a concentration equivalent to that generated by the paper towel method.
- Allow two minutes for the IAA test concentration to stabilize before starting the fit test exercises. This would be an appropriate time to talk with the test subject; to explain the fit test, the importance of his/her cooperation, and the purpose for the test exercises; or to demonstrate some of the exercises.

- If at any time during the test, the employee detects the banana-like odor of IAA, the test is failed. The employee shall quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.
- If the test is failed, the employee shall return to the selection room and remove the respirator. The employee shall repeat the odor sensitivity test, select and put on another respirator, return to the test area and again begin the fit test procedure described in (b) (1) through (7) above. The process continues until a respirator that fits well has been found. Should the odor sensitivity test be failed, the employee shall wait at least 5 minutes before retesting. Odor sensitivity will usually have returned by this time.
- If the employee passes the test, the efficiency of the test procedure shall be demonstrated by having the subject break the respirator face seal and take a breath before exiting the chamber.
- When the employee leaves the chamber, they shall remove the saturated towel and return it to the person conducting the test, so that there is no significant IAA concentration buildup in the chamber during subsequent tests. The used towels shall be kept in a self-sealing plastic bag to keep the test area from being contaminated.

#### 6.3.5 Other

- Additional Qualitative fit testing methods may be used provided they adequately test breakthrough or leakage of the respirator and testing is conducted according to manufacturer specifications.
- Qualitative fit testing may be conducted using manufacturer supplied hoods or equivalent test enclosures, and nebulizers using suitable fit testing solutions (e.g. sodium saccharin, Bitrex®, etc.).

## 7.0 Quantitative Fit Test (QNFT) Protocols

### 7.1 General

- 7.1.1 A quantitative fit test measures the adequacy of a respirator's fit by numerically measuring the amount of leakage into the respirator. A minimum fit factor of 500, and in some cases 1000, is required for a successful quantitative fit test.
- 7.1.2 AECOM will confirm that persons administering QNFT are able to calibrate equipment and perform tests properly, recognize invalid tests, calculate fit factors properly, and confirm that test equipment is in proper working order.
- 7.1.3 Quantitative fit testing is applicable to all tight fitting respirators. Quantitative fit tests (QNFT) are required for all full-face masks and SCBA and multi-functional SCBA air-line configurations.
- 7.1.4 AECOM will confirm that QNFT equipment is kept clean and is maintained and calibrated according to the manufacturer's instructions so as to operate at the parameters for which it was designed.

### 7.2 Ambient Aerosol Condensation Nuclei Counter (CNC) Quantitative Fit Testing Protocol

- 7.2.1 The ambient aerosol CNC quantitative fit testing (Portacount™) protocol quantitatively fit tests respirators with the use of a probe. The probed respirator is only used for QNFTs. A probed respirator has a special sampling device installed on the respirator to allow the probe to sample the air from inside the mask. A probed respirator is required for each make, style, model, and size that the employer uses and can be obtained from the respirator manufacturer or distributor. The CNC instrument manufacturer, TSI Inc., also provides probe attachments (TSI sampling adapters) that permit fit testing in an Employee's own respirator. A minimum fit factor pass level of at least 100 is necessary for a half-mask respirator, and a minimum fit factor pass level of at least 500 is required for a full facepiece negative pressure respirator. The entire screening and testing procedure shall be explained to the Employee prior to the conduct of the screening test.

#### 7.2.2 Portacount Fit Test Requirements

- Check the respirator to make sure the sampling probe and line are properly attached to the face piece and that the respirator is fitted with a particulate filter capable of preventing

significant penetration by the ambient particles used for the fit test (e.g., National Institute for Occupational Safety and Health, Title 42 Code of Federal Regulations 84 series 100, series 99, or series 95 particulate filter) according to the manufacturer's instructions.

- Instruct the Employee to be tested to don the respirator for 5 minutes before the fit test starts. This purges the ambient particles trapped inside the respirator and permits the wearer to make certain the respirator is comfortable. This Employee shall already have been trained on how to wear the respirator properly.
- Check the following conditions for the adequacy of the respirator fit: chin properly placed; adequate strap tension, not overly tightened; fit across nose bridge; respirator of proper size to span distance from nose to chin; tendency of the respirator to slip; self-observation in a mirror to evaluate fit and respirator position.
- Have the person wearing the respirator do a user seal check. If leakage is detected, determine the cause. If leakage is from a poorly fitting face piece, try another size of the same model respirator, or another model of respirator.
- Follow the manufacturer's instructions for operating the Portacount and proceed with the test.
- The Employee shall be instructed to perform the exercises in General Test Exercises.
- After the test exercises, the Employee shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried.

#### 7.2.3 **Portacount Test Instrument**

- The Portacount will automatically stop and calculate the overall fit factor for the entire set of exercises. The overall fit factor is what counts. The Pass or Fail message will indicate whether or not the test was successful. If the test was a Pass, the fit test is over.
- Since the pass or fail criterion of the Portacount is Employee programmable, the test operator shall confirm that the pass or fail criterion meet the requirements for minimum respirator performance.
- A record of the test needs to be kept on file, assuming the fit test was successful. The record shall contain the Employee's name; overall fit factor; make, model, style, and size of respirator used; and date tested.

## User Seal Check

S3AM-123-ATT2

### 1.0 Requirements

- 1.1 The Employee who uses a tight-fitting respirator is to perform a user seal check to confirm that an adequate seal is achieved each time the respirator is put on.
- 1.2 Either the positive and negative pressure checks listed here or the respirator manufacturer's recommended user seal check method shall be used.
- 1.3 User seal checks are not substitutes for qualitative or quantitative fit tests.
- 1.4 If either the positive or negative pressure checks fail, do not use the respirator and mark it as out of service.

### 2.0 Facepiece Positive and/or Negative Pressure Checks

#### 2.1 Positive pressure check

- Close off the exhalation valve and exhale gently into the facepiece.
- If a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the seal, the face fit is considered satisfactory
- For some respirators, this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

#### 2.2 Negative pressure check

- Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold your breath for 10 seconds.
- The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. If this is the case, the test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove.
- If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

### 3.0 Manufacturer's Recommended User Seal Check Procedures

- 3.1 The respirator manufacturer's recommended procedures for performing a user seal check may be used instead of the positive and/or negative pressure check procedures, provided that the employer demonstrates that the manufacturer's procedures are equally effective.

## Respirator Cleaning

S3AM-123-ATT3

### 1.0 Requirements

- 1.1 These procedures are general in nature. The cleaning recommendations provided by the manufacturer for a respirator may be used, provided such procedures are as effective as those listed here.
- 1.2 Equivalent effectiveness simply means that the procedures used must accomplish the objectives set forth (e.g., confirm that the respirator is properly cleaned and disinfected in a manner that prevents damage to the respirator and does not cause harm to the user).

### 2.0 Procedures for Cleaning Respirators

- 2.1 Remove filters, cartridges, or canisters. Disassemble facepieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.
- 2.2 Wash components in warm (110 degree Fahrenheit [°F]; 43 degree Celsius [°C] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.
- 2.3 Rinse components thoroughly in clean, warm (110°F [43°C] maximum), preferably running water. Drain.
- 2.4 When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for 2 minutes in one of the following:
  - Hypochlorite solution (50 parts per million [ppm] of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 110°F (43°C); or,
  - Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45 percent alcohol) to one liter of water at 110°F (43°C); or,
  - Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.
- 2.5 Rinse components thoroughly in clean, warm (110°F [43°C] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.
- 2.6 Components should be hand dried with a clean, lint-free cloth or air dried.
- 2.7 Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.
- 2.8 Test the respirator to ensure that all components work properly.
- 2.9 After the fit test, wipe down the respirator with a sanitary swab.
- 2.10 Store the respirator according to manufacturer recommendations (e.g., away from direct sunlight, in a proper container to maintain cleanliness, etc.).



Americas

## Respiratory Equipment Fit Test

S3AM-123-FM1

Date of Testing:		Respirator Type(s):	
Employee Name:		Respirator Model & Size:	
Method & Testing Agent:			
Corrective lenses needed: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Is the employee medically qualified to wear a respirator? <input type="checkbox"/> Yes <input type="checkbox"/> No      Date of last medical exam (if applicable):			
Is the employee trained on the fundamental principles of respiratory protection, use, selection, inspection, cleaning, maintenance, and storage of equipment? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Test Exercise		Test Exercise	
Sensitivity Check	<input type="checkbox"/> Pass <input type="checkbox"/> Fail	Normal Breathing	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
Deep Breathing	<input type="checkbox"/> Pass <input type="checkbox"/> Fail	Turning Head (side to side)	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
Moving Head (up/down)	<input type="checkbox"/> Pass <input type="checkbox"/> Fail	Rainbow Passage*	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
Bending Over	<input type="checkbox"/> Pass <input type="checkbox"/> Fail	Normal Breathing	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
Successful Respirator Fit Determined: <input type="checkbox"/> Yes <input type="checkbox"/> No			
I certify that I have been tested with the respirator(s) listed above. I have also had the opportunity to ask questions and those questions have been answered to my satisfaction. I also understand that the above fit test is voided if respirator limitations are not followed or the respirator is not worn or if conditions (e.g., facial hair) prevent a good face seal.			
Employee Signature:		Date:	
Signature of Tester:		Date:	

**\*Rainbow Passage.** "When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch with its path high above and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow."

Respiratory Equipment Fit Test (S3NA-123-FM1)  
Revision 1 December 15, 2016

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1 of 1

Americas

## Voluntary Use of Respirators

S3AM-123-FM2

**Instructions: An employee that is opting to use a respirator for non-overexposure conditions shall read this page, and then sign on the bottom of the page. A copy shall be maintained in the employee's training file.**

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for employees. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the employee.

Sometimes employees may wear respirators to avoid exposures to hazards, even if the amount of the hazardous substance does not exceed the limits set by regulatory standards. Voluntary masks may be used for nuisance dust, pollen, and sometimes noxious odors. If your employer provides respirators for your own voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not pose a hazard.

1. Read and follow all instructions provided by the manufacture on use, maintenance, cleaning, and care, and warnings regarding the respirators limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. A label or statement of certification should appear on the respirator or respirator packaging; it will tell you what the respirator is designed for and how it will protect you. "The National Institute for Occupational Safety and Health (NIOSH) certifies respirators in the U.S and Canada."
3. Do not wear your respirator into atmospheres containing contaminants against which your respirator is not designed to protect. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, fumes, smoke, or very small solid particles.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.
5. If you have any health conditions (e.g., asthma; high blood pressure; emphysema; heart disease, etc.) that could be aggravated by using a respirator, you should check with your doctor before using one.

I have read and understand this information:

Date: \_\_\_\_\_

---

Employee's Name (Please Print):

---

Employee's Signature:

Americas

## Respiratory Equipment Inspection

S3AM-123-FM3

Date:		Inspected by:		
Serial #:				
<b>Examine Face Piece for:</b>		N/A	Pass	Fail
Excessive dirt		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cracks, tears, holes, or distortion from improper storage		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inflexibility (stretch and massage to restore flexibility)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cracked or badly scratched lenses in full facepieces		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Incorrectly mounted full facepiece lens or broken or missing mounting clips		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lens sealed properly in receptacle, retaining clamp secured		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cracked / broken air-purifying element holder(s), badly worn threads, missing gasket(s)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Examine the Head Straps or Head Harness for:</b>				
Breaks		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Loss of elasticity		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Broken or malfunctioning buckles and attachments		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Excessively worn serrations on head harness that might permit slippage (full facepieces only)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tears in headband at cradle attachment		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Examine the Inhalation and Exhalation Valves for:</b>				
Foreign material, such as detergent residue, dust particles, or human hair under the valve seat		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cracks, tears, or distortion in the valve material		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper insertion of the valve body in the facepiece		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cracks, breaks, or chips in the valve body, particularly in the sealing surface		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper installation of the valve in the valve body		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Missing or defective valve cover		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Examine the Air Purifying Elements for:</b>				
Incorrect cartridge, canister, or filter for the hazard		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Incorrect installation, loose connection, missing / worn gaskets, cross-threading in the holder		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cracks or dents on the outside case of the filter, cartridges or canister, indicated by the absence of sealing material, tape, foil, etc. over the inlet		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Expired shelf life date on cartridge or canister		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Examine PAPR, SCBA and Escape Bottles for:</b>				
Damage or wear evident on the regulator or hoses		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cylinder pitted, dented or otherwise damaged		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cylinder / tank certified to the standard of applicable jurisdiction, hydrostatic test current		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Defects Noted:				
Unit Deemed Suitable for Use		<input type="checkbox"/> Yes	<input type="checkbox"/> No	

## **Attachment F**

### **Sanitation Plan**

## **SANITATION PLAN**

### **INTRODUCTION**

AECOM personnel will strive to maintain the workplace in sanitary condition to eliminate the health hazard posed by unsanitary conditions.

### **DRINKING WATER**

AECOM shall provide an adequate supply of potable drinking water for their personnel. Portable containers used to dispense drinking water shall be capable of being tightly closed and equipped with a drain faucet. Water shall not be dipped from containers. The water container shall be labeled "Drinking Water". A common drinking cup is prohibited. Where disposable cups are supplied, both a sanitary container for the unused cups and a receptacle for disposing of the used cups will be provided.

#### **Nonpotable Water**

Outlets dispensing nonpotable water will be conspicuously posted "CAUTION - WATER UNSAFE FOR DRINKING, WASHING, OR COOKING."

Cross-connection - open or potential - between a system furnishing potable water and a system furnishing nonpotable water is prohibited.

### **TOILETS**

AECOM shall provide toilet facilities for their personnel. The minimal number of toilets and urinals shall comply with EM 385-1-1 Section 2.E. AECOM will make arrangements to have the facilities pumped and cleaned weekly or more frequently based on usage. Toilet facility will be designated for both male and female personnel and label as such.

Enclosed temporary/ portable toilet facilities which contain a toilet seat and urinal will be provided on the project site. The facilities are constructed to protect personnel from the weather and falling objects and are equipped a self closing door capable of being latched.

Exceptions to this requirement will apply to mobile crews where work activities and locations permit transportation to nearby toilet facilities.

### **WASHING FACILITIES**

Hand washing facilities such as a portable sink or hand sanitizer will be provided at toilet facilities. Where hand washing facilities are provided they will be maintained in sanitary condition and provided with water, soap and means of drying. The washing facilities at nearby buildings will be used for persons to wash where harmful substances are used.

## **FOOD SERVICE OPERATIONS**

As part of the project no food service operations will be conducted. Personnel who obtain food from an off-site location (home) will be provided with a clean and safe place to consume their meal/take a break. No food or beverage will be consumed or stored in a toilet room or in any area where hazardous materials may be present.

## **WASTE DISPOSAL**

An adequate number of waste receptacles will be provided in the break area for food scrapes and litter. These receptacles will have a tight-fitting cover and emptied at least daily.

## **VERMIN CONTROL**

Vermin control on this project is the responsibility of the bases. If vermin control is needed the facility will be contacted.



## **Attachment G**

### **Alcohol and Drug Abuse Policy**





# AECOM Technology Corporation Employee Handbook

AECOM Core Value: Employees

Revision Date: October 2013



## Drug-Free Workplace

AECOM is committed to providing a safe and healthy workplace for all employees. Consistent with this commitment and in keeping with the federal Drug-Free Workplace Act of 1988, it is the policy of AECOM to maintain a drug-free workplace.

### Key provisions

AECOM policy prohibits employees from being under the influence of alcohol or drugs or improperly using medication in any way that could diminish, or raise questions concerning, an employee's ability to perform at his or her best while performing services for or on behalf of AECOM. Employees who are under the influence of alcohol or any controlled substance have the potential for interfering with their own and their coworkers' safe and efficient job performance. Compliance with this policy is considered a condition of employment.

This policy also prohibits the sale, possession, manufacturing and/or distribution of illegal drugs, and/or other controlled substances in the workplace or while on company business off premises. Violations of this policy will be considered to be gross and willful misconduct and will result in disciplinary action, up to and including termination. Any illegal substances discovered in the workplace will be turned over to the appropriate law enforcement agency and may result in criminal prosecution.

### Company-sponsored events

It is understood that employees may at times attend company-sponsored events where alcohol is served. While consuming alcohol on such occasions is not prohibited, employees are expected to exercise proper judgment and must observe professional, legal and common-sense guidelines at all times.

Prior approval from management and Human Resources is required for any on-site AECOM-sponsored event where alcohol is served. In addition, such events must comply with the following conditions:

- Employees should not be expected to return to work after attending the event.
- Transportation arrangements will be provided for employees who need such assistance.

### Testing for drugs and alcohol

Drug and/or alcohol screening may be required:

- Of any applicant to whom a job offer has been made.
- Of any employee where there is reason to believe that he or she may be using illegal or non-prescribed drugs or may be under the influence of drugs and alcohol. "Reason to believe" includes an injury or accident at work where there is reason to believe that employee impairment may have been a factor. "Reason to believe" may be based on objective symptoms such as the employee's appearance, behavior or speech.
- As part of occasional follow-up testing if the employee is found to have breached these policies but has been permitted to remain employed.
- As required by client contract, project, or if an employee is employed in a safety-sensitive position. Under these limited circumstances, employees may also be subjected to pre-employment and random drug screening.

An employee's cooperation with such drug or alcohol screening tests is required as a condition of employment. The employee's refusal to cooperate with such a request and to provide a specimen may result in termination where there is reason to believe that the employee has violated this policy and the employee's refusal to cooperate has prevented a medical determination of his or her condition. Any violation of this policy may result in immediate termination.

Employees who take the initiative of advising their supervisor or Human Resources in advance that they have a medical problem with regard to alcohol or drug use, and who demonstrate a commitment to take the necessary remedial action, may be eligible for a medical leave of absence for such purpose and may not be subjected to disciplinary action.

As part of the disciplinary process and, at its sole discretion, AECOM may require employees who violate this policy to successfully complete a drug abuse assistance or rehabilitation program as a condition of continued employment.

Persons whose positions with AECOM require driving as part of their work may be removed from such positions and/or subject to termination if found to have been driving under the influence of alcohol or controlled substances whether on or off-duty.

**Drug conviction**

An employee who has been convicted of a felony under a criminal drug statute for a violation occurring on company property or during the employee's working hours must notify Human Resources no later than five (5) calendar days after the felony conviction becomes final under the law.

[Return to Contents](#)

## **Substance Abuse Policy Statement**

S3AM-019-ATT1

### **POST ON EMPLOYEE BULLETIN BOARD**

#### **A. PURPOSE**

AECOM is committed to the establishment and maintenance of a safe and efficient work environment for all employees free from the effects of alcohol, illegal drugs, other controlled substances and prohibited items such as drug paraphernalia. This policy and procedure applies to all Americas - based employees and operations and is consistent with the Drug-Free Workplace Act of 1988 and in accordance with federal, state / provincial / territorial, and local laws and regulations.

#### **B. POLICY**

1. This policy prohibits the use, possession, presence in the body, manufacture, concealment, transportation, promotion or sale of the following items or substances on company premises.

Company premises refer to all property, offices, facilities, land, buildings, structures, fixtures, installations, aircraft, automobiles, vessels, trucks and all other vehicles and equipment - whether owned, leased or used.

- Illegal drugs (or their metabolites), designer and synthetic drugs, mood or mind altering substances, and drug use related paraphernalia unless authorized for administering currently prescribed medication;
  - Controlled substances that are not used in accordance with physician instructions or non-prescribed controlled substances;
  - Alcoholic beverages while at work or while on any customer- or AECOM-controlled property. This prohibition on alcohol applies whenever an employee is on-duty, including during meal or break periods, while on Company premises, or while representing AECOM. AECOM may make exceptions and permit the consumption of alcohol beverages at work-related events, such as Company-sponsored or approved business meals, conferences, or holiday events. Employees who choose to consume alcohol on approved occasions are expected to exercise good judgment and to refrain from becoming intoxicated or impaired. If an employee has consumed alcohol and needs transportation home, the Company will reimburse the cost of a taxicab or other reasonable costs of transportation so that the employee may avoid driving.
2. Employees who violate this policy or the established Substance Abuse Prevention program will be subject to disciplinary action up to and including termination.
  3. AECOM reserves the right to establish drug and/or alcohol search and screening procedures consistent with applicable local, state, and national laws.
  4. The Substance Abuse Program Manager shall be responsible for the development, implementation and administration of the substance abuse prevention program. Employees will comply with testing as directed by this policy.
  5. Substance abuse awareness and control is a responsibility of all employees. Managers and supervisors are to be properly trained in abuse recognition and have authority and responsibility to deal with impaired personnel.
  6. Projects will participate in and fully comply with any client-imposed substance abuse prevention program when such programs are a contractual condition.
  7. Project and site labor agreements may include specific requirements for testing and reporting of results which will apply to affiliated employees.



## **Attachment H**

### **Cold Stress Prevention Plan and Heat Stress Prevention Plan**

## Cold Stress

S3AM-112-PR1

### 1.0 Purpose and Scope

- 1.1 To protect employees from the severest effects of cold stress (hypothermia) and cold injury and to identify exposures to cold working conditions under which it is believed nearly all employees can be repeatedly exposed without adverse health effects.
- 1.2 This procedure applies to all AECOM Americas based employees and operations working outdoors in damp and cool (below 50 degrees Fahrenheit [°F] or 10 degrees Celsius [°C]) conditions or anytime temperatures are below 32°F or 0°C.

### 2.0 Terms and Definitions

- 2.1 **Cold Stress** – The production of physiological effects due to cold temperatures and/or wind chill.
- 2.2 **Equivalent Chill Temperature (ECT)** – Also known as Wind Chill (see below).
- 2.3 **Frostnip** – Superficial cooling of tissues without cellular destruction.
- 2.4 **Frostbite** – Freezing of tissue, resulting in tissue destruction.
- 2.5 **Hypothermia** – Condition of reduced core body temperature to 95°F (35°C) resulting in loss of dexterity, loss of mental alertness, collapse, and possible death.
- 2.6 **Wind Chill** – The combined effect of air temperature and wind. Also expressed as "equivalent chill temperature" (ECT), wind chill is defined as heat loss resulting from the effects of air temperature and wind velocity upon exposed skin.

### 3.0 References

- 3.1 S3AM-003-PR1 SH&E Training
- 3.2 S3AM-128-PR1 Medical Screening & Surveillance Program
- 3.3 S3AM-208-PR1 Personal Protective Equipment
- 3.4 S3AM-314-PR1 Working Alone
- 3.5 S3AM-315-PR1 Working On or Near Water
- 3.6 S3AM-333-PR1 Marine Safety & Vessel Operations

### 4.0 Procedure

#### 4.1 Roles and Responsibilities

##### 4.1.1 Manager

- Ensuring the safety of employees on their project sites, consistent with regulatory standards.
- Implement cold stress prevention measures as applicable at each work site.
- Develop/coordinate a work-warning regimen, as applicable.
- Confirm cold stress hazard assessments/evaluations were completed for the planned activities.
- Assign employees physically capable of performing the assigned tasks. Consider acclimation to cold weather when evaluating employee capability.
- Confirm employees are properly trained to recognize the symptoms of cold stress.

#### 4.1.2 **Safety, Health and Environment (SH&E) Manager**

- Conduct/support cold stress assessments/evaluations.
- Conduct/support incident investigations related to potential cold stress-related illnesses.
- Assist project teams develop appropriate work-warming regimens.
- Provide cold stress awareness training.

#### 4.1.3 **Supervisor**

- Identify the tasks that may be most impacted by cold stress and communicate the hazard to the assigned employees.
- Confirm that employees have been trained on the recognition of cold stress-related illnesses.
- Confirm that adequate supplies of warm fluids/drinks are readily available to employees.
- Confirm that a warm/sheltered rest area is available, as applicable.
- Conduct cold stress monitoring, as applicable.
- Implement the work-warming regimen.
- Confirm that first aid measures are implemented once cold stress symptoms are identified.
- Confirm that employees are physically capable of performing the assigned tasks and are not in a physically compromised condition.

#### 4.1.4 **Employee**

- Observe each other for the early symptoms of cold stress-related illnesses.
- Maintain an adequate intake of available fluids.
- Report to work in a properly rested condition.
- Report all suspected cold stress-related illnesses.

### 4.2 **Requirements**

- 4.2.1 Carefully plan work anticipated to be performed in cool or cold conditions. If possible, heavy work should be scheduled during the warmer parts of the day or when the wind is most calm. Include costs in project budgets for specialized equipment and supplies needed to complete the field activities.
- 4.2.2 Staff working in extreme cold (wind chill or ECT below 10°F or -12°C) shall not work alone. The Buddy System shall be utilized to keep an eye on each other and to watch for signs of cold stress. Refer to *S3AM-314-PR1 Working Alone*. Watch for symptoms and signs of hypothermia.
- 4.2.3 Monitor weather forecasts and weather conditions such as ambient temperature, wind speed, and precipitation. Use observations prior to entering and while in the field to ensure appropriate protections are in place:
- If possible, move the work to a warm location.
  - If possible and as applicable, erect shelters or screens around the work area.
  - If possible, heat the work area.
  - If possible, adjust schedule according to the cold conditions, work level and worker acclimatization.
  - Implement a work-warming regimen by taking breaks out of the cold. As applicable, consult *S3AM-112 ATT1 Temperature Thresholds* to determine wind chill and work-warming schedule.
  - Take frequent short breaks in warm dry shelters to allow your body to warm up. Limit time of exposure to the cold. If shelter is not readily available, consider supplying temporary shelters.



- Provide assistance to prevent body heat loss, such as:
  - Providing appropriate sources of heat (e.g. warm packs, portable heaters, etc.).
  - Use of insulating materials on equipment handles when temperatures drop below 30°F (-1°C).

4.2.4 All staff working in extreme cold or snow conditions should understand the following guidelines for preventing and detecting hypothermia and frostbite; refer to *S3AM-112-ATT2 Symptoms & Treatment*:

- Ensure appropriate PPE requirements are established and adhered to.
- Avoid exhaustion or fatigue because energy is needed to keep muscles warm.
- Because prolonged exposure to cold air or to immersion in cold water at temperatures even well above freezing can lead to dangerous hypothermia, whole-body protection shall be used.
- Eat high calorie snacks to help maintain body metabolism.
- Confirm extra blankets or sleeping bags are on-site.
- Drink plenty of warm liquids. It is easy to become dehydrated in cold weather.
- Avoid caffeine and alcohol, which can act as diuretics. Alcohol consumption, depending upon quantity, can dilate blood vessels enhancing body heat loss or constrict blood vessels decreasing heat delivery to extremities.
- NEVER IGNORE SHIVERING. Persistent or violent shivering is a clear warning that you are on the verge of hypothermia.
- If you experience frost bite or hypothermia, find shelter and warmth and contact a medical practitioner if symptoms persist, refer to *S3AM-128-PR1 Medical Screening & Surveillance*.

4.3 Training

Before they begin work in a cold environment, employees that might be exposed to cold stress will be informed of the potential for cold stress and how to prevent cold stress. Employees that have not had the training within the twelve prior months shall repeat the training before exposure to cold stress, refer to *S3AM-003-PR1 SH&E Training*. Employees potentially exposed to cold stress will receive training including, but not limited to:

- 4.3.1 Sources of cold stress, the influence of protective clothing, and the importance of acclimatization.
- 4.3.2 How the body loses heat.
- 4.3.3 Recognition of cold-related illness symptoms.
- 4.3.4 Cold stress preventative/corrective measures including, but not limited to:
  - Weather monitoring.
  - Proper eating and drinking practices.
  - Work-warming schedules and proper re-warming techniques.
  - Buddy system.
  - Safe cold work practices appropriate to the work that is to be performed.
  - Proper use of cold environment personal protective clothing.
- 4.3.5 The harmful effects of excessive alcohol consumption in a cold stress environment.
- 4.3.6 The hazards associated with unstable snow or ice build ups.
- 4.3.7 First aid procedures for symptoms related to cold stress.

#### 4.4 Personal Protective Equipment (PPE)

Wearing the right clothing is crucial to avoiding cold stress. The type of fabric also makes a difference. Cotton loses its insulation value when it becomes wet. Wool, on the other hand, retains its insulation even when wet. Adequate insulating dry clothing will be required in air or wind chill temperatures below 40 °F (4.4°C)

All PPE will comply with the requirements of *S3AM-208-PR1 Personal Protective Equipment* and consider the following requirements:

- 4.4.1 Wear at least 3 layers of clothing to help prevent cold stress. It is important to preserve the air space between the body and the outer layer of clothing to retain body heat.
  - Wear a middle layer of down, wool, or similar materials to provide insulation.
  - Avoid cotton, especially blue jeans.
  - Wear an outer layer to break the wind and allow some ventilation (e.g., Gortex® or nylon)
  - Do not wear tight clothing. Loose clothing allows better ventilation.
- 4.4.2 Wear proper clothing, including head coverings and gloves or mittens for cold, wet, and windy conditions.
- 4.4.3 Wear a hat or hardhat liner. Up to 40 percent of body heat can be lost when the head is left exposed.
- 4.4.4 Use insulated footwear with adequate traction to prevent slips and falls.
- 4.4.5 Wear insulated boots or other insulated footwear, and insulated gloves to help reduce the chance of frostbite.
- 4.4.6 Keep a change of dry clothing available in case work clothes become wet.
- 4.4.7 Eye and face protection for employees employed outdoors in a snow and/or ice-covered terrain should be supplied.
  - Sunglasses (with UVA and UVB protection) and sunscreen should be used when there is a persistent combination of snow and direct sun.
  - Special safety goggles to protect against blowing ice crystals and ultraviolet light and glare (which can produce temporary conjunctivitis and/or temporary loss of vision) should be required when there is an expanse of snow coverage causing a potential eye exposure hazard.
  - Ensure face guards are used to protect skin in cold, windy conditions, including riding on an unshielded vehicle.

#### 4.5 General Cold Stress Prevention Measures

- 4.5.1 In order to prevent hypothermia:
  - Wear appropriate clothing and PPE as determined by the weather conditions.
  - When active, ventilate excess heat by opening or removing outer layers of clothing to avoid sweating.
    - Start with the mitten or gloves, unless protection from ice, snow, or cold metal surfaces is needed.
    - Next remove head gear and neck wrappings.
    - Then coats/parkas should be opened at the waist and sleeves.
    - Finally, layers of clothing should be taken off.
    - When resting or tired, or colder conditions are encountered, add additional layers of clothing/ close outer layers in the reverse of the above order, or get out of the cold. Have a sweet drink but do not indulge in heavy eating.

- Garments worn to keep out rain and spray should also allow water vapor to escape.
- Take advantage of heat from the sun and stay out of the wind as much as possible.
- Have available emergency shelter providing protection from wind and rain and insulation from the ground.
- Replace wet clothing. If wet clothing cannot be replaced, then cover it with a layer of non-breathing material to prevent evaporation. Place an insulation layer over this non-breathing material.
- Get adequate rest; conserve energy.
- Get adequate nutrition to replenish energy stores; rest after meals.
- Drink adequate fluids to avoid dehydration.
- If any project / location staff member shows signs of hypothermia, stop and treat him/her.

4.5.2 In order to prevent frost bite:

- Dress to prevent hypothermia and protect the feet and hands.
- Avoid obstruction of circulation by, for example, tight boots or tightly fitting clothing.
- Avoid nicotine (particularly cigarettes) and do not consume alcohol.
- Keep ears and nose covered and out of the wind.
- Frostbite of the corneas of the eyes can be prevented by protective goggles.
- Adopt a "buddy system" of constantly watching the faces of others in the party for white skin tissue, which is evidence of frostbite (frostnip).
- Practice constant personal vigilance for signs of trouble in one's own fingers and toes; when in doubt, investigate thoroughly before it is too late.

4.5.3 Adequate, insulating dry clothing that will help maintain core temperatures above 96.8°F (37°C) shall be provided to employees if work is performed in air temperatures below 40°F (4.4°C). Wind chill cooling rate and the cooling power of air are critical factors. The higher the wind speed and the lower the temperature in the work area, the greater the insulation value of the protective clothing required.

4.5.4 An Equivalent Chill Temperature (ECT) chart relating the actual dry bulb air temperature and the wind velocity is presented in *S3AM-112-ATT1 Temperature Thresholds*. Unless unusual or extenuating circumstances exist, cold injury to other than hands, feet, and head is not likely to occur without the development of the initial signs of hypothermia. Superficial or deep local tissue freezing will occur only at temperatures below 32°F (0°C) regardless of wind speed. However, older employees, those with circulatory problems and those with previous cold injuries require special precautionary protection against cold injury. The use of extra insulating clothing and/or a reduction in the duration of the exposure period are among the special precautions that should be considered.

4.5.5 Continuous exposure of skin should not be permitted when the air speed and temperature results in an ECT of -25°F (-32°C) or below.

4.5.6 At air temperatures of 40°F (4.4°C) or less, it is imperative that employees who become immersed in water or whose clothing becomes wet be immediately removed from the cold environment, provided a change of clothing, and be treated for hypothermia.

4.5.7 If the air velocity at the job site is increased by wind, draft, or artificial ventilating equipment, the cooling effect of the wind should be reduced by shielding the work area or by wearing an easily removable windbreak garment.

4.5.8 Adequate protection, such as general ventilation, shall be incorporated into any warming shelter design to prevent carbon monoxide poisoning.

- 4.5.9 Operation of internal combustion or similar devices within warming shelters is prohibited.
- 4.5.10 If the available clothing does not give adequate protection to prevent hypothermia or frostbite, work should be modified or suspended until adequate clothing is made available or until weather conditions improve.
- 4.5.11 Walking and working surfaces shall be cleared of ice and snow to prevent slips and falls.
- 4.5.12 Confirm that employees carry fire starter materials if working in remote areas.
- 4.5.13 Supplies such as PPE, fuels, enclosures, de-icing, traction aids, warm drinks, and batteries will be specified by the SH&E Manager and/or the Manager and made available. These supplies will be inspected at least weekly during cold weather projects and replaced when necessary.
- 4.6 Cold Stress Prevention Measures for the Hands
  - 4.6.1 Special protection of the hands is required to maintain manual dexterity for the prevention of accidents including, but not limited to the following:
    - If fine work is to be performed with bare hands for more than 10 to 20 minutes in an environment below 60°F (15°C), special provisions should be established for keeping the employees' hands warm. For this purpose, warm air jets, radiant heaters (fuel burner or electric radiator), or contact warm plates may be utilized. Metal handles of tools and control bars should be covered by thermal insulating material at temperatures below 30°F (-1°C).
    - If the air temperature falls below 60°F (15°C) for sedentary work, 40°F (4.4°C) for light work, or 20°F (-6°C) for moderate work, and fine manual dexterity is not required, employees should use gloves.
  - 4.6.2 To prevent contact frostbite, employees should wear anti-contact gloves:
    - When cold surfaces below 20°F (-6°C) are within reach, each employee should be warned to prevent inadvertent contact by bare skin.
    - If the air temperature is 0°F (-18°C) or less, employees should protect their hands with mittens or appropriate gloves. Machine controls and tools for use in cold conditions should be designed so that they can be handled without removing the mittens or gloves.
    - Ensure an adequate supply of dry gloves is available to replace wet gloves.
  - 4.6.3 Provisions for additional total body protection are required if work is performed in an environment at or below 40°F (4.4°C). The employees should wear cold protective clothing appropriate for the level of cold and physical activity.
  - 4.6.4 Additional Cold Stress Prevention Measures:
 

For work practices at or below 10°F (-12°C) ECT, the following will apply:

    - The employee should be under constant protective observation (buddy system or supervision).
    - The work rate should not be so high as to cause heavy sweating that will result in wet clothing. If heavy work is being performed, rest periods should be taken in heated shelters and opportunities to change into dry clothing should be provided.
    - New employees should not be required to work full time in the cold during the first days of employment until they become acclimated to the working conditions and required protective clothing. Refer to *S3AM-112-ATT1 Temperature Thresholds* for guidance.
    - The weight and bulkiness of clothing should be included in estimating the required work performance and weights to be lifted by the employee.
    - The work should be arranged in such a way that sitting still or standing still for long periods is minimized. Unprotected metal chair seats should not be used. The employee should be protected from drafts to the greatest extent possible.

- 4.6.5 Employees handling evaporative liquid (gasoline, alcohol, or cleaning fluids) at air temperatures below 40°F should take special precautions to avoid soaking of clothing or gloves with the liquids because of the added danger of cold injury due to evaporative cooling. Special note should be taken of the particularly acute effects of splashes of “cryogenic fluids” or those liquids with a boiling point that is just above ambient temperature.
- 4.6.6 Trauma sustained in freezing or subzero conditions requires special attention, because an injured employee is predisposed to cold injury. Special provisions should be made to prevent hypothermia and freezing of damaged tissue in addition to providing for first aid treatment.

#### 4.7 Hypothermia in Water

- 4.7.1 Loss of body heat to the water is a major cause of deaths in boating and working near water incidents. Often the cause of death is listed as drowning; however, the primary cause is often hypothermia. It should also be noted that alcohol lowers the body temperature around 2 to 3 degrees by dilating the blood vessels. Do not drink alcohol around cold water. The following table shows the effects of hypothermia in water:

WATER TEMPERATURE	EXHAUSTION	SURVIVAL TIME
32.5°F (0°C)	Under 15 minutes	Under 15 to 45 minutes
32.5 to 40°F (0 to 4°C)	15 to 30 minutes	30 to 90 minutes
40 to 50°F (4 to 10°C)	30 to 60 minutes	1 to 3 hours
50 to 60°F (10 to 16°C)	1 to 2 hours	1 to 6 hours
60 to 70°F (16 to 21°C)	2 to 7 hours	2 to 40 hours
70 to 80°F (21 to 27°C)	3 to 12 hours	3 hours to indefinite
Over 80°F (27°C)	Indefinite	Indefinite

- 4.7.2 Some points to remember when water is a potential hazard:

- Wear a personal flotation device when drowning is a potential hazard. Refer to *S3AM-315-PR1 Working On or Near Water*, and *S3AM-333-PR1 Marine Safety & Vessel Operations*.
- If the water is less than 50°F (10°C), wear a wet suit or dry suit for work in water (e.g., wading, or if a significant potential to fall in water exists).
- While in the water, do not attempt to swim unless to reach nearby safety. Unnecessary swimming increases the rate of body heat loss. Keep the head out of the water. This will increase survival time.
- Keep a positive attitude about rescue. This will increase chances of survival.
- If there is more than one person in the water, huddling is recommended to conserve body heat.

- 4.7.3 If an employee or equipment is to work on ice and the water beneath the ice is or may be more than ¾ feet (1m) deep at any point:

- Test the ice prior to commencing to ensure it will support the load to be placed on it. Ongoing testing may be necessary.
- If there is any risk of falling through the ice employees must wear personal protective equipment that will ensure buoyancy and protect against hypothermia at all times while on the ice.

#### 4.8 Work-Warming Regimen

- 4.8.1 If work is performed continuously in the cold at an equivalent chill temperature (ECT) at or below 19°F (−7°C), heated warming shelters (tents, cabins, rest rooms, etc.) should be made available nearby. The employees should be encouraged to use these shelters at regular intervals; the frequency will depend on the severity of the environmental exposure. Refer to *S3AM-112-ATT1 Temperature Thresholds* for guidance.

- 4.8.2 The onset of heavy shivering, minor frostbite (frostnip), the feeling of excessive fatigue, drowsiness, irritability, or euphoria are indications for immediate return to the shelter.
- 4.8.3 When entering the heated shelter, the outer layer of clothing should be removed and the remainder of the clothing should be loosened to permit sweat evaporation or a change of dry work clothing provided.
- 4.8.4 A change of dry work clothing should be provided as necessary to prevent employees from returning to the cold environment with wet clothing.

## **5.0 Records**

- 5.1 Exposure assessments will be documented in the location's files.

## **6.0 Attachments**

- 6.1 [S3AM-112-ATT1 Temperature Thresholds](#)
- 6.2 [S3AM-112-ATT2 Symptoms & Treatment](#)

## Heat Stress

S3AM-113-PR1

### 1.0 Purpose and Scope

- 1.1 Establishes a Heat Illness Prevention Program to guide employees in preventing heat illness, recognition of the symptoms of heat stress-related illnesses and in taking the appropriate corrective action.
- 1.2 This procedure applies to all AECOM Americas-based employees and operations.

### 2.0 Terms and Definitions

- 2.1 **Acclimated** – Employees who have developed physiological adaptation to hot environments characterized by increased sweating efficiency, circulation stability, and tolerance of high temperatures without stress. Acclimatization occurs after 7 to 10 consecutive days of exposure to heat and much of its benefit may be lost if exposure to hot environments is discontinued for a week.
- 2.2 **Chemical Protective Clothing (CPC)** – Apparel that is constructed of relatively impermeable materials intended to act as a barrier to physical contact of the Employee with potentially hazardous materials in the workplace. Such materials include Tyvek® coveralls (all types) and polyvinyl chloride coveralls and rain suits.
- 2.3 **Heat Cramps** – A form of heat stress brought on by profuse sweating and the resultant loss of salt from the body.
- 2.4 **Heat Exhaustion** – A form of heat stress brought about by the pooling of blood in the vessels of the skin and in the extremities.
- 2.5 **Heat Rash** – A heat-induced condition characterized by a red, bumpy rash with severe itching.
- 2.6 **Heat Stress** – The combination of environmental and physical work factors that constitute the total heat load imposed on the body.
- 2.7 **Heat Stroke** – The most serious form of heat stress, which involves a profound disturbance of the body's heat-regulating mechanism.
- 2.8 **Sunburn** – Caused by unprotected exposure to ultraviolet radiation present in sunlight that is damaging to the skin (Refer to *S3AM-121-PR1 Non-Ionizing Radiation*). The injury is characterized by red painful skin, blisters, and/or peeling.
- 2.9 **Unacclimated** – Employees who have not been exposed to hot work conditions for one week or more or who have become heat-intolerant due to illness or other reasons.

### 3.0 References

- 3.1 S3AM-003-PR1 SH&E Training
- 3.2 S3AM-004-PR1 Incident Reporting, Notifications & Investigation
- 3.3 S3AM-010-PR1 Emergency Response Planning
- 3.4 S3AM-121-PR1 Non-Ionizing Radiation
- 3.5 S3AM-208-PR1 Personal Protective Equipment
- 3.6 S3AM-209-PR1 Risk Assessment & Management

## 4.0 Procedures

### 4.1 Roles and Responsibilities

#### 4.1.1 Managers

- Evaluate the need for heat illness prevention measures and incorporate as appropriate into the Safe Work Plan or Task Hazard Analysis.
- Allocate sufficient resources for the management of heat illness in the field including the provision of water, a shaded break area, and sufficient schedule to allow for breaks.

#### 4.1.2 Safety, Health and Environment (SH&E) Manager

- Provide heat illness awareness training.
- Assist in developing appropriate work-rest schedules.
- Conduct/support incident investigations related to potential heat stress-related illnesses.

#### 4.1.3 Supervisor

- Identify those tasks that may be most impacted by heat stress and communicate the hazard to the assigned Employees.
- Confirm that Employees have been trained on the recognition of heat illness.
- Confirm that this procedure, along with any applicable Safe Work Plan and/or Task Hazard Analysis (and heat exposure control plan that may be contained therein) are made available to affected Employees.
- Confirm that adequate supplies of appropriate fluids are readily available to Employees.
- Confirm that a proper rest area is available.
- Conduct heat illness monitoring, as applicable.
- Implement the work-rest schedule.
- Confirm that first aid measures are implemented once heat stress symptoms are identified.
- Confirm personnel are physically capable of performing the assigned tasks and are not in a physically compromised condition.
- Report all suspected heat illnesses.

#### 4.1.4 Employee

- Observe each other for the early symptoms of heat illnesses.
- Maintain an adequate intake of available fluids.
- Be familiar with heat stress hazards, predisposing factors, and preventative measures.
- Report to work in a properly vested and hydrated condition.
- Report all suspected heat stress-related illnesses.

### 4.2 Restrictions

- 4.2.1 The Buddy System is required when working in high heat conditions; Employees shall not work alone.
- 4.2.2 Employees shall not be exposed to levels exceeding those specified for the given work level and work-rest regimen as listed in *S3AM-113-ATT1 Temperature Thresholds*.
- 4.2.3 Clothing corrections shall be applied in accordance with the tables provided in *S3AM-113-ATT1 Temperature Thresholds*.



#### 4.3 Exposure Controls

4.3.1 It shall be determined whether Employees are or may be exposed to hazardous heat levels. The Supervisor shall:

- Conduct a heat stress assessment to determine the potential for hazardous exposure of Employees. Assessment shall include, but not limited to:
  - Ambient temperature.
  - Amount of sunshine (cloudy, clear). Refer to *S3AM-121-PR1 Non-Ionizing Radiation* additional direction concerning ultraviolet radiation exposures.
  - Other radiant heat sources (e.g. motor, fire, etc.).
  - Humidity.
  - Air flow.
  - Amount or type of physical labor being performed,
  - Physical condition of the Employees (e.g., acclimated/not)
  - Protective clothing in use.
  - Referral to *S3AM-113-ATT1 Temperature Thresholds* to assist in determining whether hazardous heat exposures may exist.
- If potential for hazardous exposure is identified, the Supervisor shall develop and implement a heat stress exposure control plan within the Safe Work Plan and/or Task Hazard Analysis. Refer to *S3AM-209-PR1 Risk Assessment & Management*.

4.3.2 If Employees are or may be exposed, the Supervisor shall implement engineering controls (e.g., shelters, cooling devices, etc.) to reduce the exposure of Employees to levels below those specified for the given work level and work-rest regimen as listed in *S3AM-113-ATT1 Temperature Thresholds*.

4.3.3 If engineering controls are not practicable, the Supervisor shall reduce the exposure of Employees to levels below those listed in *S3AM-113-ATT1 Temperature Thresholds* by providing administrative controls, including a work-rest cycle or personal protective equipment, if the equipment provides protection equally effective as administrative controls.

4.3.4 If Employees are or may be exposed, the Supervisor shall provide and maintain an adequate supply of cool, fresh, potable water close to the work area for the use of a heat exposed Employee. Water shall be provided (paid) by the project or program; if Employees purchase their own drinking water because water is not otherwise available on site, they shall be reimbursed.

4.3.5 If an Employee shows signs or reports symptoms of heat stress or strain, they shall be removed from the hot environment and treated by an appropriate first aid attendant on site, if available, or by a physician, refer to *S3AM-113-ATT2 Symptoms & Treatment* for more specifics.

#### 4.4 Heat Stress Planning

4.4.1 Heat stress can be a significant site hazard, especially for Employees wearing CPC. To prepare for emergency response planning, refer to *S3AM-010-PR1 Emergency Response Planning* procedure.

4.4.2 The project and site specific risks need to be planned using the SH&E Plan and the Task Hazard Assessments (THA). Refer to the *S3AM-209-PR1 Risk Assessment & Management* procedure.

4.4.3 The heat a worker is exposed to may be a combination of air temperature, radiant heat, and humidity. The WBGT (wet-bulb globe thermometer) is a useful index of the environmental contribution to heat stress. Because WBGT is only an index of the environment, the contributions of

work demands, clothing, and state of acclimatization shall also be accounted for, as described in the following steps.

- Monitor ambient temperatures and conduct heat stress monitoring in accordance with the location specific SH&E Plan. Revise the heat stress monitoring and controls if there are any reports of discomfort due to heat stress.
- Monitor temperatures in each unique environment in which workers perform work (e.g., take WBGT measurements inside truck cabs for truck drivers, and take separate WBGT measurements in the outdoor area where field employees work, etc.). Follow manufacturer's instructions on proper use of the WBGT.
- Determine if individual workers are acclimatized or un-acclimatized. Full heat acclimatization requires up to 3 weeks of continued physical activity under heat-stress conditions similar to those anticipated for the work. Its loss begins when the activity under those heat-stress conditions is discontinued, or when there is a sustained increase in temperatures of 10 °F (5.6 °C) or more, and a noticeable loss occurs after 4 days. A worker can be considered acclimatized for the purpose of this procedure when they have been exposed to the site conditions (including level of activity) for 5 of the last 7 days.
- Determine the approximate workload of each worker or group of workers. The following examples (Table 1) can be used for comparison:

Table 1  
Examples of Activities within Workload Categories

Categories	Example Activities
Resting	Sitting quietly
	Sitting with moderate arm movements
Light	Sitting with moderate arm and leg movements
	Standing with light work at machine or bench while using mostly arms
	Using a table saw
	Standing with light or moderate work at machine or bench and some walking about
Moderate	Scrubbing in a standing position
	Walking about with moderate lifting or pushing
	Walking on level at 3.5 miles/hr (6 km/hr) while carrying 6.6 lbs (3kg) weight load
Heavy	Carpenter sawing by hand
	Shoveling dry sand
	Heavy assembly work on a non-continuous basis
	Intermittent heavy lifting with pushing or pulling (e.g., pick-and-shovel work)
Very Heavy	Shoveling wet sand

- Determine the approximate proportion of work within an hour during a typical shift. Typically, the initial work schedule will be 60 minutes of work per hour (100 percent work) with a small break in the morning and afternoon, as appropriate, and a 30-minute lunch break mid-day.
- For workers wearing cloth coveralls (e.g., Nomex fire resistant clothing), add 3 to the measured WBGT. For impermeable clothing, such as Tyvek or Saranex, the WBGT procedures cannot be used. For these situations, workers should begin physiological monitoring as soon as the temperature in the work area exceeds 70°F (21°C).
- Use the collected information to develop appropriate work to rest schedules as detailed in *S3AM-113-ATT1 Temperature Threshold*.

4.4.4 Given the work demands (light, moderate, heavy or very heavy), heat of the work environment, and such aspects as PPE in use, workload will be adjusted appropriately to allow for proper acclimation.

- This is the process by which the body "gets used to" hot work environments. This is achieved by slowly increasing workloads.
  - New and returning Employees (absent one week or more) who have not had time to acclimatize may be more susceptible to heat related illnesses, even in seemingly low risk heat exposures.
  - All Employees shall be allowed time to acclimatize in the event of a heat wave. All Employees assigned to a new process with additional heat exposures shall be allowed to acclimatize.
  - Minimize workload and gradually increase as tolerance is built up. Allow for more frequent breaks.
  - While acclimatization normally takes approximately 5 to 7 days, heightened monitoring of these Employees will be maintained for the first 14 days.
- 4.4.5 Employees shall be instructed in the recognition of heat stress symptoms, the first aid treatment procedures for severe heat stress, and the prevention of heat stress injuries. Employees shall be encouraged to immediately report any heat stress that they may experience or observe in fellow Employees. Supervisors shall use such information to adjust the work-rest schedule to accommodate such problems.
- 4.4.6 Wherever possible, a designated break area should be established in an air conditioned space, or in shaded areas where air conditioning is impractical. The break area should be equipped to allow Employees to loosen or remove protective clothing, and sufficient seating should be available for all Employees. During breaks, Employees shall be encouraged to drink plenty of water or other liquids, even if not thirsty, to replace lost fluids and to help cool off. Cool water should be available at all times in the break area, and in the work area itself unless hygiene/chemical exposure issues prevent it.
- 4.5 Symptoms and Treatment
- 4.5.1 Refer to *S3AM-113-ATT2 Symptoms & Treatment*.
- 4.5.2 Employees who exhibit ANY signs of significant heat stress (e.g., profuse sweating, confusion and irritability, pale, clammy skin) shall be relieved of all duties at once, made to rest in a cool location, and provided with large amounts of cool water.
- 4.5.3 Anyone exhibiting symptoms of heat stroke (red dry skin, or unconsciousness) shall be taken immediately to the nearest medical facility. Steps shall be taken to cool the person during transportation (clothing removal, wet the skin, air conditioning, etc.).
- 4.5.4 Severe heat stress (heat stroke) is a life-threatening condition that shall be treated by a competent medical authority.
- 4.6 Prevention
- 4.6.1 Requirements for working in extreme heat may be triggered by a regulatory established criteria (e.g. CAL/OSHA requires high heat procedures when temperature equals or exceeds 95°F) or as a result of a hazard analysis assessing various contributory factors (refer to *S3AM-113-ATT1 Temperature Thresholds*). Employees working in extreme heat or sun should understand and apply the following guidelines for preventing and detecting heat exhaustion and heat stroke.
- When possible, begin hydrating at least three days prior to working in high heat conditions.
  - Review the heat stress exposure control plan within the Safe Work Plan and/or Task Hazard Analysis.
  - If the supervisor is not immediately available confirm a reliable method of communication is in place to allow for contact with supervision. In the absence of cellular reception a satellite phone or similar device may be required.

- Take frequent short breaks in areas sheltered from direct sunlight; eat and drink small amounts frequently.
- Try to schedule work for the coolest part of the day, early morning and evening.
- Avoid strenuous physical activity outdoors during the hottest part of the day.
- Avoid sudden changes of temperature. Refer to *S3AM-113-ATT1 Temperature Thresholds*.
- Air out a hot vehicle before getting into it.
- Obtain medical direction if taking diuretics during hot weather (a lower dose may be necessary).
- When working in heat, drink 1 quart of water per hour of work.
- Avoid caffeine and alcohol as they increase dehydration.
- Monitor urine frequency and color to detect dehydration. Refer to the *S3AM-113-ATT3 Dehydration Chart*.
- The Buddy System is required when working in high heat conditions to enable effective communication and cross-observation for indications of heat stress.
- Initiate emergency response procedures when necessary, including contacting emergency medical services as appropriate and in accordance with the Emergency Response Plan.

#### 4.6.2 Personal Protective Equipment

- Review the *S3AM-208-PR1 Personal Protective Equipment* procedure.
- Wear a hat and light-colored, loose-fitting clothing to reflect the sun.
- Apply sunscreen to exposed skin (SPF 30 or greater, follow directions on label).
- Wear sunglasses with UV protection.
- Pack extra water to avoid dehydration (try freezing water in bottles overnight to help keep the water cooler for longer during the day).

#### 4.7 Work-Rest Schedule Practices

- 4.7.1 Intake of fluid will be increased beyond that which satisfies thirst, and it is important to avoid "fluid debt," which will not be made up as long as the individual is sweating.
- Two 8-ounce glasses of water should be taken prior to beginning work, then up to 32 ounces (1 quart) per hour during the work shift; fluid replacement at frequent intervals is most effective.
  - The best fluid to drink is water; liquids like coffee or soda do not provide efficient hydration and may increase loss of water.
  - If commercial electrolyte drinks (e.g., Gatorade) are used, the drink should be diluted with water, or 8 ounces of water should be taken with each 8 ounces of electrolyte beverage.
- 4.7.2 Additional salt is usually not needed and salt tablets should not be taken.
- 4.7.3 Replacement fluids should be cool and fresh, but not cold.
- 4.7.4 Breaks will be taken in a cool, shaded location, and any impermeable clothing should be opened or removed.
- A relatively cool, shaded area shall be provided for breaks when working in hot environments. For hazardous waste sites, the rest area should be located in the support zone adjacent to the contamination reduction zone, situated so that part of it is in the decontamination area so workers can take breaks without going through full decontamination.

- If shade is not available, shaded areas shall be constructed. This same type of canopy can be set up to shade personnel performing various types of work in hot weather.
- Cooling measures other than shade (e.g., misting, air conditioned break areas, air conditioned vehicles, etc.) can be used in lieu of shade provided it can be demonstrated that they are at least as effective in cooling employees.
- Employees should have access to these rest areas at break times and at any other time when suffering from heat illness or believing a preventive recovery period is needed.

4.7.5 Dry clothing or towels will be available to minimize chills when taking breaks.

4.7.6 Manual labor will not be performed during breaks, other than paperwork or similar light tasks.

4.7.7 Other controls that may be used include:

- Scheduling work at night or during the cooler parts of the day (6 am–10 am, 3 pm–7 pm).
- Erecting a cover or partition to shade the work area.
- Auxiliary cooling - wearing cooling devices beneath protective garments, but over any underclothing.
  - If cooling devices are worn, only physiological monitoring will be used to determine work activity.
  - These vests typically provide cooling via one of two methods: the use of ice or other frozen media, or the use of a vortex cooler. Each method has its advantages and disadvantages.
  - The frozen media vest requires a means for freezing the media, and the media (usually water or "blue ice") will melt, requiring replacement.
  - The vortex cooler tends to cool more uniformly. Instead of frozen media, this vest uses the expansion of compressed air to cool the wearer. The drawback is the compressed air requirement, but this is negated when the wearer is already using an airline respirator supplied by a compressor. A vortex cooler should not be supplied from air cylinders, as this will draw down the cylinders rapidly.
- Auxiliary cooling should be considered when the following conditions exist:
  - Ambient temperature over 80°F (26°C).
  - Workers are wearing impermeable garments (i.e., Tyvek, Saranex, Chemrel, etc.).
  - It is desirable to have long work shifts with minimum interruption.

#### 4.8 Evaluating the Work-Rest Schedule's Effectiveness

4.8.1 Once a work-rest schedule is established, the Supervisor shall continually evaluate its effectiveness through observation of Employees for signs/symptoms of heat stress. Have workers assess themselves and their body's reaction to the heat and work conditions (self-assessment), and report any signs or symptoms of heat illness. These can include nausea or dizziness, heat cramps, extreme thirst, or very dark urine.

4.8.2 Measurement or physiological monitoring of each Employee's vitals (e.g., pulse, blood pressure, and temperature) can provide additional information in determining if the schedule is adequate. Refer to *S3AM-113-ATT1 Temperature Thresholds* for additional guidance on when physiological monitoring should be conducted.

4.8.3 Frequency of physiological monitoring is increased or decreased depending upon such factors as worker fitness, acclimatization, temperature of the work environment, type of PPE, etc.

Based on the results of the physiological monitoring and on the workers' self-assessments, the work period may be adjusted as follows:

- The work period may be increased (generally, by 5- to 10-minutes intervals, up to a maximum of 4 hours) if the results of the first 2 hours of the physiological monitoring and the workers' self-assessments indicate that workers are recovering adequately (see below), and on the judgment of the SH&E Manager.
  - The work period shall be decreased if the results of the physiological monitoring and the workers' self-assessment indicate that workers are NOT recovering adequately (see below).
- 4.8.4 If physiological monitoring is conducted, the Employee and/or the SH&E Manager (or appropriate designate) shall measure and record body temperature and pulse rate as described below.
- 4.8.5 Monitor body temperature to determine if Employees are adequately dissipating heat build-up. Ear probe thermometers which are adjusted to oral temperature (aural temperature) are convenient and the preferred method of measurement. Determine work/rest regimen as follows:
- Measure oral body temperature at the end of the work period. Oral body temperatures are to be obtained prior to the employee drinking water or other fluids.
  - If temperature exceeds 99.6°F (37.5°C), shorten the following work period by 1/3 without changing the rest period.
  - If, at the next rest period, temperature still exceeds 99.6°F (37.5°C), the worker should not be allowed to continue work until repeated temperature measurements are in the acceptable range (i.e., less than 99.6°F). Do not leave the worker alone during the recovery time. Watch for signs of heat illness and be prepared to implement emergency response as necessary.
  - Do not allow a worker to wear impermeable PPE when his/her oral temperature exceeds 100.6°F (38.1°C).
- 4.8.6 At the start of the workday each Employee's baseline pulse rate (in beats per minute [bpm]) is determined by taking a pulse count for 15 seconds and multiplying the result by four or by using an automated pulse count device. Pulse rates can then be measured at the beginning of each break period and two minutes thereafter to determine if the rest period allows for adequate recovery.
- Take the radial (wrist) pulse as early as possible in the rest period and determine the worker's heart rate in beats per minute. The heart rate is determined by counting the pulse for ten seconds and multiplying the number by 6 to get the beats per minute. Record this as P1.
  - Wait 2 minutes and repeat the pulse measurement. Record this as P2.
  - If P1 is greater than or equal to 110 beats per minute (bpm) and if (P1 – P2) is less than or equal to 10 bpm (indicating that workers are not recovering adequately), shorten the next work cycle by 1/3 without changing the rest period.
  - At the next rest period, if P1 is still equal to or greater than 110 bpm, and if (P1 – P2) is still less than or equal to 10 bpm, shorten the following work cycle by 1/3 without changing the rest period.
  - At the third rest period, if P1 is still equal to or greater than 110 bpm and (P1 – P2) is still less than or equal to 10 bpm, the worker should not be allowed to continue work until repeated pulse measurements are in the acceptable range (i.e., P1 is less than 110 bpm and (P1 – P2) is greater than 10 bpm). Do not leave the worker alone during the recovery time. Watch for signs of heat illness and be prepared to implement emergency response as necessary.
- 4.8.7 Use of an automated or similar blood pressure device will be used to assess each Employee's blood pressure at the beginning and end of each break period to determine if the rest period allows adequate cooling by applying the following criteria:
- If the blood pressure of an Employee is outside of 90/60 to 150/90, then the Employee will not be allowed to begin or resume work; extend the break period by at least five minutes, at the end of which blood pressure rates will be re-measured and the end-of-break criteria again applied.

- 4.8.8 All physiological monitoring of heat stress will be documented using *S3AM-113-FM1 Heat Stress Monitoring Log*.

#### 4.9 Training

- 4.9.1 Employees and their Supervisors that may be exposed to the hazard will be trained and oriented to the hazard and the controls prior to work commencing.
- 4.9.2 Those Employees, including Supervisors, potentially exposed to heat stress will receive training, refer to the *S3AM-003-PR1 SH&E Training* procedure. Training will include, but is not limited to:
- Sources of heat stress (environmental and personal), influence of protective clothing, and importance of acclimatization;
  - How the body handles heat and acclimatization;
  - Recognition of heat-related illness symptoms;
  - Preventative/corrective measures including, but not limited to;
    - Employees will be informed of the harmful effects of excessive alcohol consumption in the prevention of heat stress.
    - All Employees will be informed of the importance of adequate rest and proper diet in the prevention of heat stress.
  - First aid procedures for heat stress-related illnesses; and
  - Immediate reporting of any heat-related incident (injury, illness, near-miss), refer to the *S3AM-004-PR1 Incident Reporting, Notifications & Investigation* procedure.

### 5.0 Records

- 5.1 None

### 6.0 Attachments

- 6.1 [S3AM-113-ATT1 Temperature Thresholds](#)
- 6.2 [S3AM-113-ATT2 Symptoms & Treatment](#)
- 6.3 [S3AM-113-ATT3 Dehydration Chart](#)
- 6.4 [S3AM-113-FM1 Heat Stress Monitoring Log](#)

## **Attachment I**

### **Site Safety and Health Plan**







# **SITE SAFETY AND HEALTH PLAN DRAFT**

Phase 2 Regional Site Inspections for  
Perfluorinated Compounds at Multiple Air  
National Guard Installations

Tucson Air National Guard Base

Tucson, Arizona

**Contract Number: W9133L-14-D-0001**  
**Task Order Number: 0007**

***Prepared for:***

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## List of Acronyms and Abbreviations

AHA	Activity Hazard Analysis
ANSI	American National Standards Institute
APP	Accident Prevention Plan
CDC	Centers for Disease Control
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
COC	Contaminant of Concern
CPR	Cardiopulmonary Resuscitation
CRZ	Contamination Reduction Zone
EC	Emergency Coordinator
EEE	Eastern Equine Encephalitis
EZ	Exclusion Zone
GPS	Global Positioning System
IDW	Investigation-Derived Waste
MSDS	Material Safety Data Sheets
NEC	National Electric Code
NGB	National Guard Bureau
NIOSH	National Institute of Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PFC	Perfluorinated Compound
PM	Project Manager
POV	Privately Owned Vehicle
PPE	Personal Protective Equipment
SH&E	Safety, Health & Environmental
SI	Site Investigation
SOPs	Standard Operating Procedures
SOW	Statement of Work
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SZ	Support Zone
U.S.	United States
USEPA	United States Environmental Protection Agency
VOC(s)	Volatile Organic Compound(s)
µg/L	micrograms per liter



# 1 Introduction

AECOM is collecting data to support Perfluorinated Compounds (PFCs) Site Investigation (SI) reports at multiple Air National Guard Installations. The Installations included in this task order include:

Selfridge ANGB, MI	Moffett Field, CA
Phoenix Sky Harbor, AZ	Channel Islands, CA
Fresno Yosemite IAP, CA	Tucson IAP, AZ
Duluth IAP, MN	Jacksonville IAP, FL
Atlantic City IAP, NJ	Savannah Hilton Head IAP, GA
Francis Gabreski Airport, NY	Fort Wayne IAP, IN
Syracuse Hancock IAP, NY	Terre Haute IAP – Hulam Field, IN
Schenectady County Airport, NY	Louisville IAP – Standiford Field, KY
Montgomery Regional Airport, AL	WK Kellogg Airport, MI
Fort Smith Regional Airport, AR	

PFC SI activities are being performed under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The state and regional federal environmental agencies in which the respective site resides is the regulatory lead for this project. The field investigation tasks planned as part of the field operations at the various installations include:

- Mobilization/Demobilization;
- Geophysical Survey
- Concrete Coring;
- Soil Borings and Soil Sample Collection; and
- Monitoring Well Installation
- Groundwater Measurement and Sampling

AHAs for the above investigation tasks are included in this SSHP. Work will be conducted in accordance with the following documents:

- National Guard Bureau (NGB) Scope of Work;
- Air National Guard Investigation Guidance, 2009;
- PFC SI Quality Assurance and Safety Plan;

This SSHP identifies and addresses all occupational safety and health hazards known to be associated with planned investigations at the project sites. All work completed by AECOM and its subcontractors will be performed in compliance with the Accident Prevention Plan (APP) and this SSHP.

The provisions of this SSHP are mandatory for all AECOM personnel engaged in fieldwork associated with the SI activities for all sites. A copy of this SSHP, any applicable SSHP supplements, the APP, and the AECOM U.S. Operations Safety, Health, and Environmental (SH&E) Manual shall be maintained on site and available for review at all times. Record keeping will be maintained in accordance with this SSHP and the applicable AECOM Americas Standard Operating Procedures. In the event of a conflict between this SSHP, AECOM SOPs, and federal, state, and local regulations, workers shall follow the most stringent/protective requirements.

This SSHP conforms to the regulatory requirements and guidelines established in the following documents:

- Title 29, Part 1910 of the Code of Federal Regulations(CFR) (29 CFR 1910), *Occupational Safety and Health Standards* (with special attention to Section 120, *Hazardous Waste Operations and Emergency Response*);
- Title 29, Part 1926 of the Code of Federal Regulations (29 CFR 1926), *Safety and Health Regulations for Construction*;
- National Institute for Occupational Safety and Health (NIOSH)/Occupational Safety and Health Administration (OSHA)/United States Coast Guard/U.S. Environmental Protection Agency (USEPA), *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, Publication No. 85-115, 1985; and
- AECOM's Corporate SH&E Program requirements as specified in the U.S. Operations SH&E Manual, a copy of which will be maintained onsite at all times.

SSHP changes and modifications will be generated as necessary to address any additional activities or changes in site conditions, which may occur during field operations.

All proposed changes/modifications to this SSHP will be in writing and will be reviewed and approved by the Regional SH&E Manager and NGB before such modifications are implemented in the field.

## 2 Site Description and Contamination Characterization

AECOM will conduct environmental services at multiple ANG facilities under the PFC SI contract. The work will be performed in accordance with the applicable Statement of Work (SOW) and associated Work Plan developed for project site. Deviations from the listed SOW will require that a Safety Professional review and changes made to this SSHP, to ensure adequate protection of personnel and other property. The following is a summary of relevant data concerning the project site, and the work procedures to be performed.

### 2.1 Site Information

This section provides a general description and historical information associated with the sites.

#### 2.1.1 General Description

See the AECOM Work Plan for a description of each of the ANG installations.

#### 2.1.2 Site Background/History

See the AECOM Work Plan for a description of the site background for each of the ANG installations

#### 2.1.3 Suspected Contamination at SI Sites

See the AECOM Work Plan for a description of the site background and suspected contamination for each of the ANG installations.

#### 2.1.4 Previous Investigations

See the AECOM Work Plan for a description of previous investigations for each of the ANG installations.

### 2.2 Site Assessment Program

The primary objective of the Task Order is to collect data at each installation to support a SI. The SI activities consist of the following:

SI: The SI objective is to gather information to support a site decision regarding the need for further CERCLA action. SI sample locations will be focused to determine whether hazardous substances are or have been released to the environment, impacted media, and whether receptors may have been impacted from a release. The tasks required to complete this objective may include:

- Mobilization/Demobilization;
- Geophysical Survey
- Concrete Coring;
- Soil Borings and Soil Sample Collection; and
- Monitoring Well Installation
- Groundwater Measurement and Sampling

AHAs for the above investigation tasks are included in this SSHP.

### **2.2.1 Mobilization/Demobilization**

Mobilization and demobilization represent limited pre- and post-task activities. These activities include driving personnel to and from the site, and transporting or shipping equipment to and from the site. This activity does not include any site preparation or intrusive activities.

### **2.2.2 Site Preparation**

Site preparation includes site orientation and training of the field team, utility mark-out and clearance, testing and cleaning of equipment as needed, and the set-up of other work support-related items. It is assumed that the Government will provide applicable maps for on-site utility locations, if available. The public utility marking service (i.e. Miss Utility) will be contacted prior to drilling to perform utility mark-outs. The utilities at ANG Installations in areas with proposed soil borings will also be located and cleared by the ANGB installation or private utility location services. Concrete coring of paved surfaces will be required at some installations. Soft digging techniques using a hand auger for the clearing of unknown utilities to a depth of three feet below ground surface (ft bgs), will be conducted, if possible. Additional information on locating underground power lines can be found in S3NA-331-PR, *Underground Utilities*.

### **2.2.3 Soil Borings and Soil Sample Collection**

A geologist will perform oversight of the soil borings installed by the drilling subcontractor. Drilling and sampling equipment will be utilized to collect soil samples. Tables presented in the Site Work Plans detail the boring depth and samples to be collected at each installation. Soil samples collected will be logged with lithologic descriptions and screened with a photo-ionization detector (PID). The PID screening results and visual observations will be used to select samples for analytical testing. If elevated levels are detected during the intrusive activities, the work area will be ventilated before other protective measures are employed.

During sampling activities, appropriate air monitoring will be conducted and the appropriate chemical resistant personal protective equipment (PPE) will be worn to protect against exposure. All activities will be completed in accordance with S3NA-321-PR. The major activities involved with the soil borings are as follows:

- Monitor air quality in the workers breathing zone;
- Drill soil cores;
- Log soils and screen with a PID;
- Laboratory sample collection;
- Decontamination of equipment; and
- Sample prep and shipping.

### **2.2.4 Groundwater Sampling**

The field sampling team will collect groundwater samples from temporary DPT points and/or monitoring wells. Groundwater samples will be collected using low-flow sampling techniques. During sampling activities, appropriate air monitoring will be conducted and the appropriate chemical resistant PPE will be worn to protect against exposure. The major activities involved with groundwater sampling are as follows:

- Pre-sampling event notifications and approval;
- Setup for sampling activities;
- Purge and sample monitoring wells;
- Monitor air quality in the workers breathing zone;

- Decontamination of equipment; and
- Sample prep and shipping.

### **2.2.5 Investigative-Derived Waste Management**

Investigation-derived waste (IDW) will be collected and categorized as non-hazardous or hazardous. IDW including purge water, decontamination fluids, and soil cuttings will be tested and disposed of within 90 calendar days of completing the field activities in accordance with federal, state, and local regulations. When dealing with hazardous wastes, review S3NA-116-NA *Hazardous materials Shipping*, and S3NA-117-PR, *Hazardous Waste Operations*.

### **2.2.6 Equipment Decontamination**

Field personnel will perform decontamination of equipment used to conduct environmental investigation and sampling activities. Before any drilling has begun and at the completion of drilling, the drilling subcontractor shall decontaminate the drill rig, casing, samplers, and all other drilling equipment that will be used on site. The drilling subcontractor shall provide a high-pressure steam cleaner for decontamination of all downhole tooling. Soil sampling equipment will be decontaminated between each use using a phosphate-free detergent and potable water. The drilling subcontractor shall construct a temporary decontamination pad to contain all decontamination water generated during decontamination of drill rigs and tools.

### **2.2.7 Site Restoration**

Site restoration will involve the backfill of borings with a bentonite-grout slurry, repair/replacement of surface cover (concrete), removal of temporary materials, and the disposal of IDW.

### **2.2.8 Additional Work Operations**

Operations at an installation may require additional tasks not identified in this section or addressed in Attachment A, AHAs. Before performing any task not covered in this SSHP, a modification to the SSHP must be prepared, and approved by the Regional SH&E Manager or designee.

### 3 Hazard / Risk Analysis

Hazards that cannot be eliminated by project design during hazard identification or the hazard assessment processes will be considered residual hazards. If unable to eliminate the hazard through design change, risk will be reduced through engineering controls or administrative controls.

Each distinct task or operation will have an AHA developed to define the activity to be performed. The AHA will identify the work sequences, site conditions, anticipated hazards (classic safety, chemical, physical, biological, ionizing radiation), control methods, equipment requirements, and training to be implemented to eliminate or reduce the hazards.

Table 3-1 identifies the hazards that are anticipated to be encountered during this project.

**Table 3-1  
Hazards Table**

Type of Hazard	Hazard	Yes	No
<b>Physical</b>	Confined space entry		✓
	Drowning		✓
	Electrical Shock	✓	
	Equipment and Machinery	✓	
	Trench entry		✓
	Lacerations and skin punctures	✓	
	Lifting and Moving (excess of 25 lbs individual and 50 lbs 2 person lift)	✓	
	Slips, trips and falls	✓	
	Heavy Equipment Operations	✓	
	Traffic/Vehicle Exposure	✓	
	Hand & Power Tool Usage	✓	
	Hazardous Noise Levels	✓	
<b>Chemical</b>	VOC, SVOC, TPH, PAHs, Metals, PFCs	✓	
<b>Environmental</b>	Heat and Cold Stress	✓	
	Hazardous Noise Levels	✓	
<b>Radiological</b>	Non-Ionizing Radiation	✓	
	Ionization Radiation		✓
<b>Biological</b>	Spiders	✓	
	Ticks	✓	
	Hazardous Plants	✓	
	Animals	✓	
	Poisonous Snakes	✓	

Operations at the site may require additional tasks not identified in Section 2.3 or addressed in Attachment A, AHA. Before performing any task not covered in this SSHP, an AHA must be prepared and approved by the Regional SH&E Manager or designee.

### 3.1 Physical Hazard Recognition and Controls

The following physical safety hazards may be encountered during this project:

- Slips, Trips, Falls and Protruding Objects;
- Electrical hazards;
- Hand and Power Tool Usage;
- Motor Vehicle Operation;
- Mechanized Machinery;
- Manual Lifting;
- Drilling Operations; and
- Traffic Exposure/Control.

#### 3.1.1 Slips, Trips, Falls, and Protruding Objects

A variety of conditions may exist that may result in injury from slips, trips, falls, and protruding objects. Slips and trips may occur as a result of wet, slippery, or uneven walking surfaces. To prevent injuries from slips and trips, always keep work areas clean; keep walkways free of objects and debris; and report/clean up liquid spills. Serious injuries may occur as a result of falls from elevated heights. Always wear fall protection while working at heights of 6 feet or greater above the next lower level. Protruding objects are any object that extends into the path of travel or working area that may cause injury when contacted by personnel. Always be aware of protruding objects and when feasible remove or label the protruding object with an appropriate warning.

#### 3.1.2 Housekeeping

During site activities, work areas will be continuously policed for identification of excess trash and unnecessary debris. Excess debris and trash will be collected and stored in an appropriate container (e.g., plastic trash bags, garbage can, roll-off bin) prior to disposal. At no time will debris or trash be intermingled with waste PPE or contaminated materials. Additional information on the requirements of housekeeping can be found in S3NA-013-PR, *Housekeeping*.

#### 3.1.3 Electrical Hazards

The following guidance is provided to ensure electricity safety at the site:

- Personnel may set up temporary circuits up to 220 volts. Maintenance or installation of circuits over 220 volts will require qualified and trained personnel.
- Lockout devices will be used to prevent the operation/energizing of equipment or circuits during maintenance or other work. Tag-out devices will be used only where it is not feasible to use a lockout device. Insulated tools and electrical handling equipment shall be inspected prior to use to ensure the protective properties are not damaged. Damaged equipment will be tagged and removed from service.
- Extension cords and electrical connections on hand-held and other power tools will be inspected prior to use for cuts, kinks, frayed wires, etc. If any deficiency is noted, the equipment will be tagged "DAMAGED" and removed from service. Manufacturer-installed insulated electrical cords will not be repaired or spliced.
- Extension cords are to be kept clean, free of kinks, and protected from oil, hot or sharp surfaces, and chemicals. Extension cords are not to be placed across aisles, through doors, through holes

in a wall, or in areas where the cord may be damaged or create a tripping hazard. Extension cords will be appropriate for the specific task and environment.

- Ground Fault Circuit Interrupter (GFCI) devices will be in place between the equipment and power source for all temporary circuits.
- Additional safety information is available in S3NA-302-PR, *Electrical Safety*.

#### **3.1.3.1 Extension Cords**

The following applies when extension cords are used during field operations:

- Extension cords for portable electric tools shall be of a 3-wire type;
- Use of extension cords is allowed only for temporary installations not to exceed 90 days;
- Extension cords shall be provided with a plug cap, which is either molded to the cord or equipped with a cord clamp to prevent strain on the terminal screws;
- Extension cords shall not be fastened with staples, or otherwise hung in a manner that could damage the outer jacket or insulation;
- Extension cords shall be inspected prior to each use to ensure that there is no damage or defects. Defective cords shall not be used;
- Extension cords used with grounding-type equipment (e.g., three-prong plug) shall contain a grounding-type conductor (have three prongs to accept the ground plug);
- GFCIs shall be used for all non-permanent wiring needed for construction purposes, or when working in wet or moist areas;
- Extension cords used in highly conductive work locations (e.g., wet areas) shall be of the type approved for such locations;
- Grounding-type equipment (e.g., three-prong plugs) shall not be modified to mate to incompatible outlets (e.g., cut off grounding prong to fit two-prong outlets);
- A temporary light shall not be suspended by the cord, unless the cord and light are designed for suspension;
- Temporary lights shall be equipped with bulb protectors, unless they are installed at least 7 or more feet overhead; and
- Electric lines crossing work areas, personnel, or vehicular traffic areas, shall be either fastened securely overhead (at a height that provides safe clearance for work operations), or protected by a cover capable of withstanding the imposed loads without creating a trip hazard.

#### **3.1.3.2 Portable Electrical Equipment**

Double-insulated, portable, industrial-type electrical tools meeting the requirements of the National Electrical Code (NEC) are authorized for use (ground wire not required). Where this type of tool is used, the equipment must be distinctly marked.

Portable electrical tools not provided with special insulating or grounding protection are not for use in damp, wet, or conductive locations (e.g., by persons standing on the ground or on metal floors).

All portable electrical appliances and equipment where the non-current-carrying metal parts are exposed to contact by personnel shall be grounded by a continuous conductor of adequate capacity from the device to a grounded receptacle. The Site Safety Health Officer (SSHO) shall resolve any question of whether or not a particular appliance should be grounded.



Manufacturer-installed guards shall not be tampered with, modified, or removed. These guards will be in place and utilized during operation of equipment.

The dimension of the working space in the direction of access to energized parts in switchboards, control panels, fused switches, circuit breakers, panel boards, motor controllers, and similar equipment that requires examination, adjustment, servicing, or maintenance while energized, shall not be less than 36 inches deep and 30 inches wide or the width of the equipment, whichever is greater.

Energized parts of electrical equipment operating at 50 volts or more shall be guarded against accidental contact by the use of approved cabinets or enclosures. Warning sign(s) shall be conspicuously placed on the enclosure.

Grounding of receptacles shall be accomplished in one of two ways:

- A built-in, green-colored ground wire may be attached to the ground pole of the receptacle; or
- The conduit system, if installed in an approved manner, may be relied upon for grounding of a receptacle serving single-phase appliances with ratings up to 230 volts. At outside construction sites, all single-phase 15- and 20-ampere receptacle outlets operating at 230 volts or less, which are not a part of the permanent wiring of the building or structure, must have GFCIs for personnel protection.

The outlet box for portable extension cords for outdoor use shall be weatherproofed and maintained in good condition.

### **3.1.4 Lock-Out/Tag-Out Procedures**

Use lockout/tagout procedures when performing maintenance or repairs on equipment.

It is the responsibility of AECOM employees to verify that all remediation equipment is locked out before AECOM employees perform any maintenance or repair work on the system. The source must be locked out; it is not enough to push the power switch to off and disconnect the breaker. Anyone can re-engage power under these circumstances. Locking out the power source is the only way to guarantee that the power will not be inadvertently reactivated.

A lock-out/tag-out kit will be located in the treatment shed for the duration of the project. The kit includes standard locks, keys, and lockout notices.

The site-specific lock-out/tag-out information must be completed for both the groundwater containment system and the SSD system. These forms will then be placed within the remediation trailer so all field technicians performing operations and maintenance work on the system are familiar with how to lockout the system when necessary. Refer to S3NA-325-PR, *Lockout Tagout*, for additional information and requirements.

### **3.1.5 Hand Tool Usage**

All manually operated hand tools and equipment shall be used in accordance with the following requirements:

- Use each tool only for the job it was designed to do.
- Discard damaged or abused tools promptly.
- Inspect for distortion, cracks, chips, wear, or mushrooming.
- Keep all tools clean and in working order.
- Be sure handles are fixed firmly to a tool's working end.

- Be sure tools and work mate properly to avoid slippage.
- Handles are made for the tool. Never use extensions.
- Confine impact forces to striking and struck tools.
- Hold work in a clamp or vise, not in your hand.
- Start off slowly when engaging the tool and the work.
- Shut current off before using a tool near electricity.
- Make sure the handle sits securely in your hand.
- Keep moving parts lightly lubed. Avoid lube leakage.
- Wear approved safety goggles when using hand tools.
- Keep hands away from sharp edges.
- Pull, don't push, a wrench handle for more leverage.
- Position your body securely while working with the tool.
- Keep jaw teeth, cutters, and blades sharp for better results.
- Keep tool's moving parts properly cleaned and tightened.
- Use steady pressure on jaws and cutters. Don't rock the tool.
- Support long, overhanging work in a vise at the far end.
- Use pads in the jaws to protect soft or crushable work.
- Use a tool close to the vise or clamp.
- Hold work in a clamp or vise with sufficient pressure.
- Keep clamped assemblies away from vibration and bumping.
- Discard a tool instead of repairing it by welding or brazing.
- Keep tools from excessive heat.
- For continuous work, use comfort grips or gloves.
- Follow instructions on the tool and/or package.
- Only non-sparking tools shall be used in locations where sources of ignition may cause a fire or explosion.
- Tools requiring heat treating or redressing shall be tempered, formed, dressed, and sharpened by personnel who are experienced in these operations.
- All recommendations regarding hand safety are available in S3NA-317-PR, *Hand Safety*.

### **3.1.6 Power Tool Usage**

The following safety precautions will be followed by project personnel using power tools in accordance with the following requirements:

- Wear appropriate eye protection such as safety glasses or face shield.
- Switch off the tools before connecting them to a power supply.
- If a power cord feels more than comfortably warm, or if a tool is sparking excessively, have it checked by an electrician or other qualified person.

- Disconnect the power supply before making adjustments or changing accessories.
- Remove any wrenches and adjusting tools before turning on a tool.
- Inspect the cord for fraying or damage before each use. Tag defective tools clearly with an Out of Service tag and replace immediately with a tool in good running order.
- During use, keep power cords clear of tools and the path that the tool will take.
- Use clamps, a vice, or other devices to hold and support the piece being worked on when practical to do so. This will allow you to use both hands for better control of the tool and will help prevent injuries if a tool jams or binds in a work piece.
- Use only approved extension cords that have the proper wire size for the length of cord and power requirements of the electric tool that you are using. This will prevent the cord from overheating.
- For outdoor work, use outdoor extension cords marked "W-A" or "W".
- Suspend power cords over aisles or work areas to eliminate stumbling or tripping hazards.
- Eliminate octopus connections: if more than one receptacle plug is needed, use a power bar or power distribution strip that has an integral power cord and a built-in over-current protection.
- Pull the plug, not the cord when unplugging a tool. Pulling the cord causes wear and may adversely affect the wiring to the plug. An electrical shock to the operator may result.
- Keep power cords away from heat, water, oil, sharp edges, and moving parts. They can damage the insulation and cause a shock.
- Avoid accidental starting by ensuring the tool is turned off before you plug it in. Also, do not walk around with a plugged-in tool with your finger touching the switch.
- Do not bypass the ON/OFF switch and operate the tools by connecting and disconnecting the power cord.
- Do not disconnect the power supply of the tool by pulling or jerking the cord from the outlet.
- Do not leave a running tool unattended. Do not leave it until it has been turned off, has stopped running completely, and has been unplugged.
- Do not use electric tools in wet conditions or damp locations unless tool is connected to a GFCI.
- Do not expose electric power tools to rain or wet conditions. Wet tools increase the likelihood for getting an electric shock.
- Avoid body contact with grounded surfaces like refrigerators, pipes, and radiators when using electric powered tools. This will reduce the likelihood of shock if the operator's body is grounded.
- Do not plug several power cords into one outlet by using single-to-multiple outlet adapters or converters ("cube taps").
- Do not use light duty power cords.
- Do not connect or splice extension cords together to make a longer connection. The resulting extension cord may not be able to provide sufficient current or power safely.
- Do not carry electrical tools by the power cord.
- Do not tie power cords in knots. Knots can cause short circuits and shocks. Loop the cords or use a twist lock plug.
- Never break off the third prong on a plug: replace broken three-prong plugs and make sure the third prong is properly grounded.

- Never use extension cords as permanent wiring. Use extension cords only as a temporary power supply to an area that does not have a power outlet.
- Do not walk on or allow vehicles or other moving equipment to pass over unprotected power cords. Cords should be put in conduits or protected by placing planks on each side of them.
- Do not brush away sawdust, shavings, or turnings while the tool is running. Never use compressed air for cleaning surfaces or removing sawdust, metal turnings, etc.
- Do not operate tools in an area containing explosive vapors or gases.
- Do not clean tools with flammable or toxic solvents.
- Do not surprise or touch anyone who is operating a tool. Startling a tool operator could end up causing an accident or injury.
- All applicable safety recommendations are detailed in S3NA-305-PR, *Hand & Tool Safety*.

### **3.1.7 Motor Vehicle Operation**

Operators of any equipment or vehicle shall be able to read and understand the signs, signals, and operating instructions in use.

Operators of motor vehicles, while on duty, shall not operate vehicles for a continuous period of more than ten hours in any 24-hour period; moreover, no employee, while on duty, may operate a motor vehicle after being in a duty status for more than twelve hours during any 24-hour period. A minimum of eight consecutive hours shall be provided for rest in each 24-hour period.

#### **3.1.7.1 Motor Vehicle Operating Rules**

The following guidelines are provided as a summary of S3NA-005-PR, *Driving*, to ensure safe operation of privately owned vehicles (POV) or rental vehicles being used on the job site:

- Operators of motor vehicles being used on projects may only use cellular telephones with hands-free devices while the vehicle is in motion. Prior to using a hand-held cellular phone, drivers shall find a safe place to bring their vehicle to a stop.
- Text messaging is strictly prohibited while operating motor vehicles.
- The use of any other portable headphones, earphones, or other listening devices (except for hands-free cellular phones) while operating motor vehicles is prohibited.
- Operators of motor vehicles will not eat, drink, or smoke while the vehicle is in motion. Seat belts shall be installed and worn.
- Global Positioning System (GPS) shall be mounted within the vehicle so that they do not create sight hazards for the operator and programming of dashboard GPS systems while driving is prohibited. The use of non-mounted GPS systems may only be used by the vehicle operator while the vehicle is stopped.
- The principles of defensive driving shall be practiced. At all times, the operator must have the vehicle under control and be able to bring it to a complete stop within a safe stopping distance.
- Vehicles may not be driven at speeds greater than the posted speed limit, with due regard for weather, traffic, intersections, width and character of the roadway, type of motor vehicle, and any other existing condition.
- Headlights shall be lighted from sunset to sunrise, during fog, smoke, rain, or other unfavorable atmospheric conditions, and at any other time when there is not sufficient light for the vehicle to be seen or the operator to see on the highway at a distance of 500 feet (150.4 meters), unless local regulations prohibit.

- Vehicles shall not be stopped, parked, or left standing on any road, or adjacent thereto, or in any area in a manner as to endanger the vehicle, other vehicles, or personnel using or passing that road or area.
- Vehicles shall not be left unattended until the motor has been shut off, the key removed (unless local regulations prohibit), parking brake set, and gear engaged in low, reverse, or park. If stopped on a hill or grade, front wheels shall be turned or hooked into the curb or the wheels securely chocked.
- When backing or maneuvering, operators will take the applicable precautions. If a signal person or spotter is not used, operators will walk behind their vehicle to view the area for possible hazards before backing their vehicle.
- All motor vehicles shall be shut down prior to and during fueling operations.

### **3.1.7.2 Transportation of Personnel**

The number of passengers in passenger-type vehicles shall not exceed the number that can be seated. No person will be permitted to ride with arms or legs outside of a vehicle body, in a standing position on the body, on running boards, seated on side fenders, cabs, cab shields, bed of the truck, or on the load.

Vehicles transporting personnel shall not be moved until the driver has ascertained that all persons are seated and the guardrails and rear end gates are in place or doors closed. Getting on or off any vehicle while it is in motion is prohibited.

Explosives, flammable materials (excepting normal fuel supply), or toxic substances may not be transported in vehicles carrying personnel and all tools and equipment shall be guarded, stowed, and secured when transported with personnel.

### **3.1.7.3 Motor Vehicle Equipment**

Every motor vehicle shall have:

- An operable speedometer;
- An operable fuel gage;
- An operable audible warning device (horn);
- An adequate rearview mirror or mirrors;
- A power-operated starting device;
- A windshield equipped with an adequate windshield wiper;
- An operable defrosting and defogging device;
- Non-slip surfaces on steps; and
- Cabs, cab shields, and other protection to protect the driver from the elements and falling or shifting materials.

Every person operating a motor vehicle shall possess, at all times while operating such vehicle, a license/permit valid for the equipment being operated. Licensing requirements will be as per State regulations for personnel. The operator must present the license/permit upon request. Failure to do so will result in the immediate prohibition of the operator to operate motor vehicles.

#### **3.1.7.4 Inspections, Tests, Maintenance, and Repairs**

Vehicle inspections, tests, maintenance, and repairs shall be conducted by a qualified person in accordance with the manufacturer's recommendations. Before initial use, vehicles not otherwise inspected by State or local authorities, shall be inspected by a qualified mechanic and found in safe operating condition and in compliance with all required published vehicle safety standards during this one-time inspection. The inspection shall be documented and available for inspection on the work site.

Vehicles shall be inspected on a scheduled maintenance program. Prior to each use, motor vehicles shall be checked by the operator to assure that the following parts, equipment, and accessories are in safe operating condition and free of apparent damage that could cause failure while in use:

- Service brakes, including trailer brake connections;
- Parking system (hand brake);
- Emergency stopping system (brakes);
- Tires;
- Horns;
- Steering mechanism;
- Coupling devices;
- Seat belts;
- Operating controls;
- Safety devices (e.g., backup alarms and lights, fire extinguishers, first-aid kits, etc.); and
- Accessories including lights, reflectors, windshield wipers, and defrosters where such equipment is necessary.

Inspection, test, repair, and maintenance records shall be maintained at the site available upon request.

Vehicles not meeting safe operating conditions shall be immediately removed from service, its use prohibited until unsafe conditions have been corrected, and re-inspected before being placed in service again.

Whenever visibility conditions warrant additional light, all vehicles, or combinations of vehicles, in use shall be equipped with the following:

- Two headlights, one on each side in the front;
- At least two red taillights and one red or amber stoplight on each side of the rear;
- Directional signal lights (both front and back); and
- Three emergency flares, reflective markers, or equivalent portable warning device.

#### **3.1.8 Machinery and Mechanized Equipment**

##### **3.1.8.1 Preparation for Use**

Before any machinery or mechanized equipment is placed into use, it shall be inspected and tested in accordance with the manufacturer's recommendations and requirements of this manual and shall be certified in writing by a competent person to meet the manufacturer's recommendations and requirements of this manual. Review S3NA-309-PR, *Heavy Equipment*, for all requirements regarding heavy equipment use.

The company will keep records of tests and inspections. These records shall be made available in a timely manner upon request by NGB and, when submitted, shall become part of the official project file.

All safety deficiencies noted during the inspection shall be corrected prior to the equipment being placed in service at the project.

Subsequent re-inspections will be conducted at least annually thereafter. Anytime the machinery or mechanized equipment is removed and subsequently returned to the project (other than equipment removed for routine off-site operations as part of the project), it shall be re-inspected and recertified prior to use.

No modifications or additions that affect the capacity or safe operation of machinery or equipment shall be made without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly.

In no case shall the original safety factor of the equipment be reduced.

#### **3.1.8.2 Daily/Shift Inspections and Tests**

All machinery and equipment shall be inspected daily (when in use) to ensure safe operating conditions. The employer shall designate competent persons to conduct the daily inspections and tests.

Tests shall be made at the beginning of each shift during which the equipment is to be used to determine that the brakes and operating systems are in proper working condition and that all required safety devices are in place and functional.

Whenever any machinery or equipment is found to be unsafe, or whenever a deficiency that affects the safe operation of equipment is observed, the equipment shall be immediately taken out of service and its use prohibited until unsafe conditions have been corrected.

A tag indicating that the equipment shall not be operated, and that the tag shall not be removed, shall be placed in a conspicuous location on the equipment. Where required, lockout procedures shall be used. The tag shall remain in its attached location until it is demonstrated to the individual deadlining the equipment that it is safe to operate.

When corrections are complete, the machinery or equipment shall be retested and re-inspected before being returned to service.

#### **3.1.8.3 Equipment Operation**

Machinery and mechanized equipment shall be operated only by designated qualified personnel.

Machinery or equipment shall not be operated in a manner that will endanger persons or property nor shall the safe operating speeds or loads be exceeded.

Getting off or on any equipment while it is in motion is prohibited.

Machinery and equipment shall be operated in accordance with the manufacturer's instructions and recommendations.

The use of headphones for entertainment purposes while operating equipment is prohibited.

Inspections or determinations of road and shoulder conditions and structures shall be made in advance to assure that clearances and load capacities are safe for the passage or placing of any machinery or equipment.

Mechanized equipment shall be shut down before and during fueling operations.

Bulldozer and scraper blades, end-loader buckets, dump bodies, and similar equipment shall be either fully lowered or blocked when being repaired or when not in use. All controls shall be in a neutral position, with the engines stopped and brakes set, unless work being performed on the machine requires otherwise.

Equipment powered by an internal combustion engine will not be operated in or near an enclosed area unless adequate ventilation is provided to ensure the equipment does not generate a hazardous atmosphere.

No one shall be permitted in the truck cab during loading operations except the driver, and then only if the truck has a cab protector.

Safeguards, i.e., bumpers, railings, tracks, etc., shall be provided to prevent machinery and equipment operating on a floating plant or dock from going into the water.

Personnel shall not work in, pass under, or ride in the buckets or booms of loaders in operation.

Each bulldozer, scraper, dragline, crane, motor grader, front-end loader, mechanical shovel, backhoe, and other similar equipment shall be equipped with at least one dry chemical or CO<sub>2</sub> fire extinguisher with a minimum rating of 10-B:C.

#### **3.1.8.4 Equipment Requirements**

The following are guidelines relating to accessories will be present and operable:

- An operable fuel gage;
- An operable audible warning device (horn);
- Adequate rearview mirror or mirrors;
- Non-slip surfaces on steps;
- A power-operated starting device;
- Seats or equal protection must be provided for each person required to ride on equipment;
- Whenever visibility conditions warrant additional light, all vehicles, or combinations of vehicles, in use shall be equipped with at least two headlights and two taillights in operable condition;
- All equipment with windshields shall be equipped with powered wipers. Vehicles that operate under conditions that cause fogging or frosting of windshields shall be equipped with operable defogging or defrosting devices. Glass in windshields, windows, and doors shall be safety glass. Cracked or broken glass shall be replaced; and
- Mobile equipment, operating within an off-highway job site not open to public traffic, shall have a service brake system and a parking brake system capable of stopping and holding the equipment while fully loaded on the grade of operation. In addition, it is recommended that heavy-duty hauling equipment have an emergency brake system that will automatically stop the equipment upon failure of the service brake system. This emergency brake system should be manually operable from the driver's position.

#### **3.1.8.5 Maintenance and Repairs**

Maintenance, including preventive maintenance and repairs shall be in accordance with the manufacturer's recommendations and shall be documented. Records of maintenance and repairs conducted during the life of a contract shall be made available upon request.



All machinery or equipment shall be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done. Equipment designed to be serviced while running are exempt from this requirement.

Heavy machinery, equipment, or parts thereof that are suspended or held apart by slings, hoist, or jacks also shall be substantially blocked or cribbed before personnel are permitted to work underneath or between them.

#### **3.1.8.6 Parking**

Whenever equipment is parked, the parking brake shall be set.

Equipment parked on an incline shall have the wheels chocked or track mechanisms blocked and the parking brake set.

All equipment left unattended at night, adjacent to a highway in normal use or adjacent to construction areas where work is in progress, shall have lights or reflectors, or barricades equipped with lights or reflectors, to identify the location of the equipment.

#### **3.1.8.7 Towing**

All towing devices used on any combination of equipment shall be structurally adequate for the weight drawn and securely mounted.

Persons shall not be permitted to get between a towing vehicle and the piece of towed equipment until both have been completely stopped with all brakes set and wheels chocked on both vehicle and equipment.

#### **3.1.9 Manual Lifting**

Most materials associated with investigation and remedial activities are moved by hand. The human body is subject to severe damage in the forms of back injury, muscle strains, and hernia if caution is not observed in the handling process. Whenever possible, use at least two people to lift, or roll/lift with your arms as close to the body as possible. Under no circumstances should any one person lift more than 49 pounds unassisted. For additional requirements, refer to S3NA-014-PR, *Manual Lifting*.

#### **3.1.10 Drilling Operations**

Drilling operations, including hollow-stem, rotary and/or direct push drilling, present their own set of hazards. Several basic precautions that should be taken include, but are not limited to, confirming locations of underground and overhead utilities, wearing of appropriate PPE and the avoidance of loose clothing or jewelry, staying clear of moving parts, knowing the locations of emergency shut-off switches. Other operational safety precautions regarding moving the drilling equipment, raising and lowering the derrick (mast), and drilling can be found in S3NA-321-PR, *Drilling, Boring, and Direct-Push Probing*.

#### **3.1.11 Traffic Exposure/Control**

During certain work tasks, the establishment of traffic control to adequately protect workers and the public may be required on-site. Site-specific requirements will be determined by the Site Supervisor/SSO on a case-by-case basis. Only approved traffic control devices per accordance with the Manual of Uniform Traffic Control Devices will be used on public roadways in accordance with the applicable State regulatory guidance.

General traffic control precautions include placing a work vehicle between your worksite and oncoming traffic whenever possible. Not only is it a large, visible warning sign, but also if an oncoming car should

fail to yield or deviate, the parked vehicle rather than your body would absorb the first impact of a crash. Turn the vehicle wheels so that if it was struck, it would swing away from the worksite. When using cones or other devices to modify traffic flow, ensure use of the proper taper length and device spacing to provide adequate warning distance to on-coming motor vehicles. In addition, proper PPE is to be worn during traffic operations, to include hardhat and high-visibility vests. Refer to S3NA-306-PR, *Highway and Road Work*, for additional requirements.

### **3.2 Environmental Hazards and Controls**

#### **3.2.1 Hazardous Noise Levels**

Occupational noise is the most significant health hazard present in the modern industrial workplace. AECOM's Hearing Conservation Program (S3NA-118-PR *Hearing Conservation Program*) complies with OSHA Occupational Noise Exposure Standards (CFR, Title 29, Part 1010.95). In addressing industrial noise, the following components are identified:

- Recognition;
- Evaluation;
- Control; and
- Training.

##### **3.2.1.1 Hearing Protection for Noise**

Certain operations can cause personnel to receive excessive exposure to noise. The Site Assessment investigation activity which has the most potential for causing over exposure to noise is drilling. When the drill rig is in operation, hearing protection will be donned by the field sampling team, including the drilling subcontractor. Hearing protection will be accomplished using earplugs, earmuffs, or a combination thereof.

### **3.3 Non-ionizing Radiation**

To protect against exposure to ultraviolet (UV) radiation, workers will observe the following requirements:

- All workers will wear sunglass-type safety glasses at all times when working outdoors during daylight hours;
- Workers will utilize a commercial sunblock with a minimum solar protection factor (SPF) of 30 or higher; and
- Wide-brim hard hats are recommended as they provide additional UV protection.

### **3.4 Ionizing Radiation**

Ionizing Radiation hazards are not anticipated for this project.

### **3.5 Biological Hazards**

It should be assumed that biological hazards exist whenever working on undeveloped property. This can include insect activity any time that local temperatures exceed 40°F for a period of more than 24 hours. The stubble and roots of poisonous plants can be a hazard any time of year, including when some plants are dormant or mown.

Employees in the field where biological hazards exist will not enter the hazard areas unless they are wearing the appropriate protective clothing, repellants, and barrier creams specified below. If the hazard

is recognized in the field but was not adequately assessed during the AHA, the affected employees shall stop work and not proceed until the AHA has been amended and protective measures implemented. Procedures for managing biological hazards are summarized in S3NA-313-PR, *Wildlife, Plants & Insects*.

### **3.5.1 Microorganisms**

Natural and artificial bodies of water (e.g., lakes, rivers, ponds, lagoons, etc.) may contain a variety of microorganisms. Microorganisms, in particular, present a significant hazard to personnel who may come into contact with water bodies. Contact with microorganisms in water may result in dermatitis, infection (i.e., in cuts/lacerations), digestive distress, and other diseases. Always be aware of areas that may contain excessive amounts of microorganisms. Such areas may include areas of standing water, areas of warm water (i.e., cooling tower effluents, etc.), and areas downstream of municipal wastewater treatment. To prevent exposure to microorganisms in water, always adhere to the following:

- Wear protective gloves (i.e., nitrile, etc.) and other appropriate PPE to prevent skin contact with water.
- Never drink from natural or artificial bodies of water. Such water is considered non-potable and is not safe for drinking.

### **3.5.2 Ticks**

Data from the Centers for Disease Control (CDC) indicates that tick-borne diseases have become increasingly prevalent. At the same time, tick repellents have become both safe and effective so it is possible to prevent the vast majority of bites and therefore most related illnesses. The most common and severe tick-borne illnesses in the U.S. are Lyme disease, Ehrlichiosis, and Rocky Mountain spotted fever.

### **3.5.3 Chiggers**

Chiggers are mite larvae, approximately  $\frac{1}{2}$  mm in size, and typically invisible to the naked eye. While chiggers are not known to carry infectious diseases, their bites and resulting rashes and itching can lead to dermatitis and a secondary infection. Chiggers are typically active from the last hard freeze in the winter or spring to the first hard freeze.

### **3.5.4 Spiders**

Spiders can be found in derelict buildings, sheltered areas, basements, storage areas, well heads and even on open ground. Spiders can be found year round in sheltered areas and are often present in well heads and valve boxes. The black widow is present in northeast states and known to be dangerous to people. The black widow prefers moist, dark conditions. Black widow bites feel like a minor pinprick, but dull pains will soon develop in the area of the bite. The affected area will generally begin to cramp and other symptoms such as sweating, nausea and vomiting may occur. Other spiders native to the area possess venom but they are not harmful to humans.

**Table 3-3**  
**Poisonous Spider Identification Guide**

**Black widows  
(*Latrodectus*)**

- Females: shiny black with red hourglass on the bottom of abdomen
- Males: more vibrant pattern on abdomen consisting of many red and white spots
- Males are rarely encountered and are not known to bite humans
- Cobweb spiders; spend most of their time in their webs
- Make webs in undisturbed, uncluttered areas on porches and in sheds

**3.5.5 Mosquitoes**

When a mosquito bites, it injects an enzyme that breaks down blood capillaries and acts as an anticoagulant. The enzymes induce an immune response in the host that results in itching and local inflammation. The tendency to scratch the bite sites can lead to secondary infections.

CDC data indicates that mosquito-borne illnesses, including the strains of encephalitis, are a health risk to employees working in outdoor environments. At least one of the Encephalitis strains listed below is known to exist in every area of the U.S. and in many other countries as well:

- Eastern Equine encephalitis (EEE);
- Western Equine encephalitis (WEE);
- West Nile Virus;
- St. Louis encephalitis (SLE); and
- La Crosse (LAC) encephalitis.

Other diseases including Dengue Fever and Malaria are spread by mosquitoes in the sub-tropic and tropical parts of the world.

**3.5.6 Bees and Hornets**

Bees, hornets, and wasps may be found in derelict buildings, sheltered areas, and even on open ground. The flying/stinging insects are not specifically included in the scope of this procedure and the PPE and other protective measures are not normally effective against aggressive, flying insects. Avoid reaching into areas where visibility is limited. If stung by a wasp, bee or hornet, notify a co-worker or someone who can help should you have an allergic reaction. Stay calm and treat the area with ice or cold water. Seek medical attention if you have any reactions to the sting such as developing a rash, excessive swelling, or pain at the site of the bite or sting or any swelling or numbness beyond the site of the bite or sting.

Employees with known allergies to insect stings should consult their personal physician for advice on any immediate medications that they should carry with them. It is recommended that employees with known allergies inform their co-workers of the allergy and the location of the medications they might carry for the allergy.

### 3.5.7 Small Mammals

Working in the field either directly or indirectly with small mammals has inherent risks of injury or exposure to zoonotic diseases (infectious diseases that can be transmitted from animals to humans) against which all field staff should protect themselves. The risks are usually higher when there is direct contact with a wild animal, either through a break in the skin (blood), saliva, or excrement; however, there are also risks through air-borne diseases (e.g., Hantavirus). Avoid animals whenever possible, and if bitten, go to the nearest medical facility.

### 3.5.8 Snakes

Snakes are rarely aggressive towards humans. If a snake encounter occurs, the worker should simply maintain a safe distance and move away from it, or allow it to move away. Only two species of venomous snakes are found in northeast areas of U.S., the copperhead and the timber rattlesnake. The best snakebite treatment is to avoid getting bitten. The following suggestions will help workers stay clear of venomous snakes.

- Learn to identify, by sight, the copperhead and timber rattlesnake.
- When working in areas where snakes might be found, watch where you put your hands and feet. Watch where you sit and where you place supplies.
- Wear suitable clothing, and when working in or around tall grass or heavy brush, wear long pants and heavy boots.
- Avoid rock piles, stacks of old boards and brush in wooded areas, as snakes use such areas frequently.
- Never handle "dead" venomous snakes; they may not be completely dead.
- Leave live snakes alone. DO NOT attempt to capture or kill them.

If bitten by any venomous animal, special care should be taken to treat the wound as it may lead to complications due to the toxin. A bite from a venomous snake, which may inject varying degrees of toxic venom, is rarely fatal but should always be considered a medical emergency. Bites from a black widow should be treated as medical emergencies. All other bites should be reported, proper first aid implemented, and the wound progression tracked.

**Table 3-4**  
**Venomous Snake Identification Guide**

#### **Northern Copperhead**

##### **(*Agkistrodon contortrix mokas*)**

- Color is a rich, reddish, brown with a series of darker hourglass markings down back
- Head is usually a bright copper color; belly is pinkish
- Seldom exceeds three feet in length
- Dark dorsal markings which are narrow on the back and broad on the sides
- Found in remote rocky, wooded areas



**Timber Rattlesnake  
(*Crotalus horridus horridus*)**

- Only species of snake in region with a segmented rattle at the end of its tail
- Brown or black chevron-shaped markings on a yellow background, down its back
- Background color may vary from a bright yellow to a dull gray; Entirely black specimens also occur
- Rarely exceeds six feet in length
- Found in the remote rocky, mountainous areas



### 3.5.9 Poisonous Plants

Poisonous Plants including poison ivy, oak, and sumac, which contain the oil urushiol that produces a rash, can lead to dermatitis and infections. Exposure to urushiol produces a rash that can be irritating and cause the exposed employee to scratch the affected area, increasing susceptibility for an infection. It should be noted that each time an employee is exposed to urushiol the severity of the reaction increases. In cases that involve severe rashes, medical treatment may be necessary to control the rash.

Employees who develop a rash as a result of exposure to poisonous plants shall report the exposure immediately to the Site Supervisor or PM who will then forward the report to the Regional SH&E Manager.



**Table 3-5  
Hazardous Plant Identification Guide**

**Poison Ivy**


- Grows in West, Midwest, Texas, East
- Several forms – vine, trailing shrub, or shrub
- Three leaflets (can vary 3-9)
- Leaves green in summer, red in fall
- Yellow or green flowers
- White berries





<p><b>Poison Oak</b></p> <ul style="list-style-type: none"><li>• Grows in the East (NJ to Texas), Pacific Coast</li><li>• 6-foot tall shrubs or long vines</li><li>• Oak-like leaves, clusters of three</li><li>• Yellow berries</li></ul>	
<p><b>Poison Sumac</b></p> <ul style="list-style-type: none"><li>• Grows in boggy areas, especially in the Southwest and Northern states</li><li>• Shrub up to 15 feet tall</li><li>• Seven to 13 smooth-edged leaflets</li><li>• Glossy pale yellow or cream-colored berries</li></ul>	

**Table 3-5  
Hazardous Plant Identification Guide (Continued)**

<b>Giant Hogweed</b> <ul style="list-style-type: none"><li>• Grows from MI to VA, found in western NY</li><li>• 8- to 14-feet tall</li><li>• Small, white flowers form a large flat-topped umbel</li><li>• Leaves up to 5-feet across, lobed and deeply incised</li></ul>	
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### 3.5.10 Personal Precautions and Protective Measures for Biological Hazards

The following precautions and protective measures will be implemented by employees conducting fieldwork where biological hazards exist:

- Chemically-treated field clothing, full length clothing, or Tyvek coveralls;
- Application of insect repellent to clothing and/or exposed skin; and
- Routine personal checks.

Disposable gloves may be cotton, leather, or synthetic materials and must not be reused after removing.

Exercise care and avoid reaching into areas where visibility is limited. If stung by an insect or bitten by a spider or tick, attempt to identify the attacker and notify a co-worker or someone who can help should the bite site become painful, discolored, or swollen. Stay calm and treat the area with ice or cold water. Seek medical attention if you have any reactions to the sting such as developing a rash, excessive swelling, or pain at the site of the bite, or any swelling or numbness beyond the site of the bite.

Oil of lemon eucalyptus, DEET and Permethrin, have been recommended by the Centers for Disease Control and Prevention (CDC) for effective protection against mosquitoes that may carry the West Nile virus and related diseases. Detailed procedures for the use of PPE are described in S3NA-208-PR, *Personal Protective Equipment*.

### 3.5.11 PPE for Poisonous Plants

Employees working in areas where poisonous plants exist shall wear either long sleeve clothing or Tyvek coveralls, and disposable cotton, leather or synthetic gloves. Employees must not touch exposed skin (neck and face) with potentially contaminated gloves. Tyvek and gloves worn to protect from exposure to poisonous plants will be treated as contaminated, removed from the body in a manner that the contamination is not spread, and placed in plastic bags for disposal.

Personal clothing that has been exposed to poisonous plants shall be decontaminated with a poisonous plant cleanser such as Tecnu or removed in a careful manner, bagged and washed separately from other clothing to remove urushiol. Work boots will be decontaminated with either soap and water or a cleansing agent such as Tecnu cleanser.



In the fall and winter, the hazard still exists in the form of stubble and roots. Employees who develop a rash as a result of exposure to poisonous plants shall report the exposure immediately to the Site Supervisor or PM who will forward the report to the Regional SH&E Manager.

### **3.5.12 Chemical Treatment of Field Clothing**

Oil of lemon eucalyptus, DEET, and Permethrin have been recommended by the CDC for effective protection against mosquitoes that may carry the West Nile virus and related diseases.

When selected as part of project's PPE requirements, the PM will ensure that field teams wear clothing treated with the chemical Permethrin, which is an insecticide with repellent properties registered with the USEPA, and recommended by the CDC. Permethrin is highly effective in preventing tick bites when applied to clothing, but is not effective when applied directly to the skin. Two options are available for Permethrin treatment of clothing worn during fieldwork:

- Pre-treatment of fabric by the clothing manufacturer; or
- Employee treatment of their personal clothing using 0.5% Permethrin spray.

#### **3.5.12.1 Pretreatment of Field Clothing**

The Permethrin pretreatment is odorless and retains its effectiveness for approximately 25 washings. After 25 washings, the pretreated clothing will be considered no longer effective and removed from service. Clothing that has been manually treated by employees will be considered effective for five wash cycles.

Use of clothing that has been pretreated with Permethrin offers a reduction in the use and application of other insect repellants that must be applied directly to the skin.

If an employee opts not to utilize chemically pretreated clothing while potentially exposed to insects, spiders, and/or ticks, they must either wear Tyvek coveralls taped to the boots or clothing consisting of long legged pants and long sleeved shirts treated with an insect repellant containing Permethrin DEET or an organic alternative to their work clothing.

#### **3.5.12.2 Lemon Eucalyptus**

Lemon Eucalyptus is a plant-based insect repellent on the market as Repel Lemon Eucalyptus. The products have been proven to be effective against mosquitoes, deer ticks, and no-see-ums for up to 6 hours. Derived from Oil of Lemon Eucalyptus, this non-greasy lotion or spray have a pleasant scent and are not known to be toxic to humans. The spray or lotions will be effective for approximately two to six hours and should be reapplied each two hours to sustain protection. Lemon Eucalyptus products cannot be applied to fire retardant clothing.

### **3.5.12.3 Personal Hygiene and Body Checks**

Tick borne diseases typically require that the tick be imbedded for four hours to begin disease transfer. The oils from poisonous plants can take up to 4 hours after exposure to penetrate the skin and react with the live proteins under the skin.

It is recommended that exposed skin be checked frequently for the presence of ticks, insects, rashes, or discolorations. External clothing should also be checked for the presence of ticks and insects; these should be retained for identification and to determine if medical treatment is needed.

Employees will shower as soon as practical after working in the field and examine their bodies for the presence of ticks, insect bites, rashes, or swollen areas. If imbedded ticks are found they should be

removed; the tick should be preserved with the date and location of the bite noted, and retained for identification if medical treatment is needed.

The presence of an imbedded tick, rash, or abnormal reactions will be reported as an SH&E Incident to the PM or Site Supervisor who will forward the report to the Regional SH&E Manager for follow up.

### **3.6 Assessment of chemical Exposure Hazards by Task**

The tasks outlined in this document have been further analyzed for potential for chemical exposure in the following subsections.

#### **3.6.1 Mobilization**

Mobilization does not involve contact with contaminated groundwater and/or soil. Chemical exposure is not anticipated for this task.

#### **3.6.2 Soil Boring and Sample Collection**

The anticipated PPE level for this activity is Level D.

Inhalation – An inhalation hazard exists during well installation activities. The monitoring procedures and action levels established in Section 8 will be followed to avoid potential exposure.

Skin Contact – A contact hazard exists during well installation activities. Employees will don the prescribed PPE to avoid contact with impacted soils.

Ingestion – Protection against exposure via ingestion can be accomplished by performance of proper decontamination procedures when exiting contaminated work areas (see Section 12).

#### **3.6.3 Groundwater Sampling**

The anticipated PPE level for this activity is Level D. The monitoring procedures shown below will be followed during all groundwater sampling activities.

Any well which has been sealed for longer than 6 hours will be allowed to ventilate for a minimum of 5 minutes upon opening, then monitored for VOC concentration using a PID. A reading in excess of 50 ppm will require additional ventilation, followed by re-monitoring. If an acceptable VOC concentration cannot be reached within 30 minutes of opening a well, reseal it and contact the Safety Professional for guidance.

Inhalation – An inhalation hazard exists during groundwater sampling activities. The monitoring procedures and action levels established in Section 8 will be followed to avoid potential exposure.

Skin Contact – A contact hazard exists during groundwater sampling activities from coming into contact with impacted groundwater. Employees will don the prescribed PPE to avoid contact with impacted groundwater.

Ingestion – Protection against exposure via ingestion can be accomplished by performance of proper decontamination procedures when exiting contaminated work areas (see Section 12).

#### **3.6.4 Additional Work Operations**

If additional work operations become necessary, the anticipated level of PPE and hazard controls will be detailed in the applicable AHA developed for the task.

## 4 Staff organization, Qualifications, and responsibilities

All personnel are responsible for continuous adherence to the APP and SSHP procedures during the performance of their work. Staff Organization, Qualifications, Responsibilities, and lines of authority are presented in Section 4.0 of the APP.

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## 5 Training

### 5.1 General Training

Personnel performing work at the job site must be qualified as HAZWOPER workers (unless otherwise noted in specific AHAs or by the SSHO), and must meet the medical monitoring and training requirements specified in the following safety procedures:

- S3NA-003-PR, *SH&E Training*;
- S3NA-115-PR, *Hazardous Materials Communication*;
- S3NA-006-PR, *Project Safety Moments*; and
- S3NA-117-PR, *Hazardous Waste Operations and Emergency Response (HAZWOPER) Activities*.

Personnel who participate in field activities associated with this project are subject to the training requirements presented in Section 6.0 of the APP.

### 5.2 Project-Specific Training

All personnel performing field activities at the site will be trained in accordance with SH&E SOP 003, *SH&E Training*. For this project, training will include the requirements specified in the following:

- S3NA-115, *Hazardous Materials Communication*;
- S3NA-006-PR, *Project Safety Moments*; and
- S3NA-117-PR, *Hazardous Waste Operations and Emergency Response (HAZWOPER) Activities*.

In addition to the general health and safety training programs, personnel will be:

- Instructed on the contents of applicable portions of this SSHP and any supplemental health and safety information developed for the tasks to be performed;
- Workers will be instructed on the proper ultraviolet radiation protection measures per S3NA-121-PR, *Non-Ionizing Radiation*;
- Informed about the potential routes of exposure, protective clothing, precautionary measures, and symptoms or signs of chemical exposure and heat stress;
- Made aware of task-specific physical hazards and other hazards that may be encountered during site work. This includes any client-specific required training for health and safety; and
- Made aware of fire prevention measures, fire extinguishing methods, and evacuation procedures.

The site-specific training will be performed prior to the worker performing the subject task or handling the impacted materials and on an as-needed basis thereafter. Training will be conducted by the SSHO (or his/her designee) and will be documented on the form attached to S3NA-117-PR, *Project Safety Meetings*.

### 5.2.1 Competent Person Training Requirements

In order to complete the planned scope of work, an OSHA-designated competent person must be onsite to perform the required daily inspections of equipment and/or operations. The competent person may be an AECOM or subcontractor employee and is defined as:

*One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.*

AECOM personnel must be designated by the SH&E Department per accordance with S3NA-202-PR *Competent Person Designation*.

## 6 Personnel Protective Equipment

### 6.1 Personal Protective Equipment

The purpose of PPE is to provide a barrier, which will shield or isolate individuals from the chemical and/or physical hazards that may be encountered during work activities. S3NA-208-PR, *Personal Protective Equipment Program*, lists the general requirements for selection and usage of PPE. All Site Assessment field activities will be conducted in Level D PPE. Table 6-1 lists the minimum PPE required during Level D site operations. The specific PPE requirements for each work task are specified in the individual AHAs found in Attachment A.

Prior to the start of field operations, the SSHO will ensure that all personnel have been trained on when and what PPE is necessary; how to properly don, doff, adjust and wear PPE; limitations of PPE; and proper care, inspection, testing, and maintenance; useful life; and storage and disposal of PPE.

By signing Section 15 (Personnel Acknowledgement) of this SSHP, you are agreeing that you have been properly trained in the use, limitations, care, and maintenance of the protective equipment you will use at this project. If you have not received training on the proper use, care, and, limitations of the PPE required for this project, please see the Project Manager or SSHO for the proper training prior to signing this SSHP.

**Table 6-1  
Personal Protective Equipment**

Type	Material	Additional Information
<b>Minimum PPE</b>		
Safety Vest	ANSI Type II high-visibility	Must have reflective tape/be visible from all sides
Boots	Leather	ANSI approved safety toe
Safety Glasses		ANSI Approved; ≥98% UV protection
Hard Hat		If overhead hazard is present. ANSI Approved; recommended wide-brim.
Work Uniform		No shorts/cutoff jeans or sleeveless shirts
<b>Additional PPE</b>		
Hearing Protection	Ear plugs and/ or muffs	In hazardous noise areas
Leather Gloves		If working with sharp objects or powered equipment.
Protective Chemical Gloves	Nitrile	
Sunscreen	SPF 30 or higher	
Cold Weather Gear	Hard hat liner, hand warmers, insulated gloves, and thick, warm socks	

## 6.2 PPE Doffing and Donning Information

The following information is to provide field personnel with helpful hints that, when applied, make donning and doffing of PPE a more safe and manageable task:

- Never cut disposable booties from your feet with basic utility knives. This has resulted in workers cutting through the bootie and the underlying sturdy leather work boot, resulting in significant cuts to the legs/ankles. Recommend using a pair of scissors or a package/letter opener (cut above and parallel with the work boot) to start a cut in the edge of the bootie, then proceed by manually tearing the material down to the sole of the bootie for easy removal;
- When applying duct tape to PPE interfaces (wrist, lower leg, around respirator, etc.) and zippers, leave approximately one inch at the end of the tape to fold over onto itself. This will make it much easier to remove the tape by providing a small handle to grab while still wearing gloves. Without this fold, trying to pull up the tape end with multiple gloves on may be difficult and result in premature tearing of the PPE;
- Have a “buddy” check your ensemble to ensure proper donning before entering controlled work areas. Without mirrors, the most obvious discrepancies can go unnoticed and may result in a potential exposure situation; and
- Never perform personal decontamination with a pressure washer.



## 7 Medical Surveillance

All on-site personnel must participate in a medical surveillance program that complies with OSHA 1910.120 where the evaluation includes a judgment of the employee's ability to use respiratory protective equipment and to participate in hazardous waste site activities. Additionally, personnel trained and certified in First Aid and Cardiopulmonary Resuscitation (CPR) will be onsite at all times when work is being performed.

All current certifications and training records for site personnel will be maintained on-site for the duration of the project. Individuals without proper training records will not be permitted on-site. All training and certification records will be made available upon request.

### 7.1 Exemptions/Exceptions to Medical Surveillance and Training

The support zone (SZ) is defined as the work zone where no contamination is present and no potential for exposure exists. AECOM personnel who remain in the SZ and never enter the exclusion zone (EZ) or contamination reduction zone (CRZ) will not be subject to exposure potential. Therefore, they are exempt from all provisions of the standard, including medical surveillance and training, as per the preamble and 29 CFR 1910.120(a)(i). This exemption to the standard holds true for all personnel working in situations where lack of exposure potential can be demonstrated.

Client and/or regulators will be responsible for the compliance parameters prescribed for their representatives, employees, visitors, subcontractors, and affiliates, as these personnel do not fall under AECOM's Health and Safety Program, the APP/SSHP, and/or AECOM authority. However, if client and/or regulatory personnel enter the AECOM exclusion zone, they will be required to wear the prescribed PPE worn by AECOM employees. Additionally, they are responsible for having documentation that they are medically capable and trained to be in the work area and/or wear the PPE. Client and/or regulatory personnel will be responsible for ensuring compliance with this requirement and are required to attend a site-specific training session given by their safety representative.

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## 8 Exposure Monitoring / Air Sampling Program

Monitoring procedures will be employed during site characterization activities to assess employee exposure to chemical and physical hazards. Monitoring will consist primarily of on-site determination of various parameters (e.g., airborne contaminant concentrations and heat stress effects), but may be supplemented by more sophisticated monitoring techniques, if necessary. The suspected contaminants of concern (COC), identified by the historical site use data, may include VOCs, SVOCs, TPH, PAH, Metals, and PFCs

### 8.1 Real-Time Exposure Measurement

Monitoring will be performed within the work area in order to detect the presence and relative levels of toxic substances. The data collected throughout monitoring will be used to determine the appropriate levels of PPE. Monitoring will be conducted as specified in each AHA (Attachment A) as work is performed.

Table 8-1 specifies the real-time monitoring equipment, which will be used for this project.

**Table 8-1**  
**Monitoring Parameters and Equipment**

Instrument	Manufacturer/Model*	Substances Detected
Photoionization Detector (PID)	RAE Systems Mini-RAE Photovac Microtip HNu Model Hnu (10.6 eV bulb)	VOCs, SVOCs, TPH, PAH

It is not anticipated that groundwater sampling will result in a sufficient dispersal of contaminants to pose an inhalation risk. While no historical data is available for heavy metal concentrations in soil, any dispersal of dust will be controlled through the utilization of DPT to advance the soil borings. Risk due to ingestion and dermal exposure will be controlled through the use of PPE and worksite housekeeping to reduce handling or dispersal of contaminated media.

#### 8.1.1 Health and Safety Action Levels

An action level is a point at which increased protection is required due to the concentration of contaminants in the work area or other environmental conditions. The concentration level (above background level) and the ability of the PPE to protect against that specific contaminant determine each action level. The action levels are based on concentrations in the breathing zone.

All field activities will be conducted in Level D PPE. If ambient levels are measured which exceed the action level (see Table 8-2), all investigations at that location will be shut down.

Personnel should also be able to upgrade or downgrade their level of protection with the concurrence of SSO or the Safety Professional.

Reasons to upgrade:

- Known or suspected presence of dermal hazards;
- Occurrence or likely occurrence of gas, vapor, or dust emission; or
- Change in work task that will increase the exposure or potential exposure to hazardous materials.

Reasons to downgrade:

- New information indicating that the situation is less hazardous than was originally suspected;
- Change in site conditions that decrease the potential hazard; or
- Change in work task that will reduce exposure to hazardous materials.

### **8.1.2 Monitoring Procedures**

A summary of the monitoring procedures and action levels are presented in Table 8-2. Any well which has been sealed for longer than six hours will be allowed to ventilate for a minimum of five minutes upon opening, then monitored at the well head for VOC concentrations using a PID. A reading in excess of 2.5 ppm will require additional ventilation, followed by re-monitoring. If an acceptable VOC concentration (below 2.5 ppm) cannot be reached within 30 minutes of opening a well, reseal it and contact the Regional Health and Safety Manager for guidance. The procedures summarized in Table 8-2 will be followed during drilling operations.

During drilling and advancement of soil borings and handling of IDW, the breathing zone will be monitored for VOC concentrations. If ambient levels are measured that exceed the action levels, on-site workers must implement the mitigative actions and control measures prior to commencing or continuing activities at the specific work area.

The lower alarm limit of the PID should be set at 2.5 ppm and the upper alarm limit should be set at 15 ppm. A lower level alarm sustained for 5 minutes requires additional analysis with VC Drager tubes. An upper level alarm sustained for 5 minutes requires stop work. The provisions below provide for the appropriate action level and action to afford respiratory protection to on-site workers during this scope of services.

**Table 8-2  
Monitoring Procedures and Action Levels**

<b>VOCs measured by PID (10.6 eV bulb) calibrated to Isobutylene</b>		
<b>Zone Location and Monitoring Interval</b>	<b>Response Level (sustained in BZ for ≥5 minutes)</b>	<b>Response Activity</b>
Worker Breathing Zone, continuous during all activities	0 - 2.5 ppm	Continue work in required PPE, station personnel up-wind, and continue monitoring.
	> 2.5 - 15 ppm	Continue work in required PPE, continue monitoring. Implement engineering controls (dilution ventilation).
	> 15 - 25 ppm	STOP WORK. Contact the SSHO, implement mitigation measures and prepare for upgrade to Level C. Contact HSM and PM.
	> 25 ppm	STOP WORK, shut down all equipment, exit, and contact the HSM and PM.

### 8.1.3 Monitoring Equipment Calibration

All instruments used will be calibrated at the beginning and end of each work shift, in accordance with the manufacturer's recommendations. If the owner's manual is not available, the personnel operating the equipment will contact the applicable office representative, rental agency, or manufacturer for technical guidance for proper calibration. If equipment cannot be pre-calibrated to specifications, site operations requiring monitoring for worker exposure or off-site migration of contaminants will be postponed or temporarily ceased until this requirement is completed.

### 8.1.4 Personal Sampling

Should site activities warrant performing personal sampling to better assess chemical exposures experienced by employees, the SSHO, under the direction of a Certified Industrial Hygienist (CIH), will be responsible for specifying the monitoring required. Within five working days after the receipt of monitoring results, the CIH will notify each employee, in writing, of the results that represent that employee's exposure. Copies of air sampling results will be maintained in the project files.

If the site activities warrant, the subcontractor will ensure its employees' exposures are quantified via the use of appropriate sampling techniques. The subcontractor shall notify the employees sampled in accordance with health and safety regulations, and provide the results to the SSHO for use in determining the potential for other employees' exposure.

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## 9 Heat and Cold Stress

Heat and cold stress may vary based upon work activities, PPE/clothing selection, the season of the year, and weather conditions. To reduce the potential of developing heat/cold stress, be aware of the signs and symptoms of heat/cold stress and watch fellow employees for signs of heat/cold stress. For additional requirements, see S3NA-113-PR, *Heat Stress* or S3NA-112-PR, *Cold Stress*.

Heat stress can be a significant field site hazard, particularly for non-acclimated personnel operating in a hot, humid setting. Site personnel will be instructed in the identification of a heat stress victim, the first-aid treatment procedures for the victim and the prevention of heat stress casualties as specified in the APP.

Heat Stress monitoring and work-rest regiments will be implemented using the Adjusted Temperature Method outlined in S3NA-113-PR, *Heat Stress*. All temperature monitoring results, physiological monitoring results, and temperature stress controls will be documented in field records using the Heat Stress Monitoring form attached to the SOP.

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## 10 Standard Operating Safety Procedures, Engineering controls, and work practices

### 10.1 Safe Work Practices

Personnel are charged with performing all job duties in a responsible manner, following and complying with regulatory standards, company safety policies, industry standards, work practices, guidelines, and project-specific requirements governing the scope of work.

Personnel must be aware of the job site conditions, work environments, client operations, contractor activities, and general public (if applicable) that may impact an employee or be impacted by or affected by one's work by observing the following guidelines:

- Work in a manner that will not put oneself, other personnel or equipment or facilities at risk;
- Identify hazardous conditions and activities in the work environment consistent with the job and training;
- If one can't remove a hazard, it should be reported to the PM promptly;
- Implement established control methods consistent with project procedures and/or training.
- Unsafe employee actions or behavior are prohibited;
- Employees performing inspections, construction observations, investigations, reviews, surveys or visits to remote sites shall work in teams of a minimum of two persons present (buddy system), or an alternate communication plan must be provided;
- Work involving the removal, handling, storage or disposal of hazardous materials or wastes requires the approval of the Regional SH&E Manager;
- Immediately report all potentially dangerous conditions and injuries, regardless of severity, to the SSO; and
- Report all accidents that result in medical treatment, equipment damage or near miss incidents to supervision immediately.

### 10.2 Personal Standards

Any employee who willfully disregards company or client safety standards, rules, or requirements is subject to disciplinary action, including removal from the project and dismissal. The following guidelines are provided:

- Carrying firearms or other weapons on company or a client's property is prohibited.
- Fighting and gambling are not permitted.
- Be considerate of the safety and welfare of others. Distracting other's attention or engaging in practical jokes and horseplay is prohibited.
- Employees are not permitted to use, sell or distribute, be under the influence, or have in their possession any controlled substances, drugs, or alcohol. The only exception is if an employee is taking prescription medication(s) under the direction of a physician. It is then the responsibility of the employee to notify one's Project Manager if the medication may impair their ability to perform their job function in a safe manner, in which case they shall be removed from that task.

- Smoking is prohibited in any area specifically designated as “NO SMOKING” and in all company facilities.
- Be alert at all times. Obey safety signs, heed warning signs and instructions.
- Report unsafe equipment, conditions, and actions or behavior to one’s task leader or supervisor promptly.
- Avoid back injuries by knowing one’s capabilities, using proper lifting techniques, and seeking assistance when needed.
- Employees should operate vehicles in a safe and conscientious manner.
- Use only designated project entrances, parking areas and facilities.
- Show or produce evidence of identification or required training if requested to gain entry to or while on a project.
- Personal cameras, video recorders, and other photographic equipment shall not be permitted on site without the PM and client’s approval.
- All employees shall direct any questions or concerns they may have about the project APP/SSHP, job tasks, instructions or conditions to the SSHO, PM or Regional SH&E Manager.

### 10.3 General Safety Rules

All site personnel shall conduct themselves in a safe manner and maintain a working environment that is free of additional hazards, in adherence to SH&E SOP 001 *Safe Work Standards and Rules* and S3NA-013-PR *Worksite Housekeeping*.

Employees are required to practice “good housekeeping” when performing job tasks at all company locations and offices. Such practices include:

- Overseeing that work areas are kept clean and organized by using approved cleaning materials for tools and equipment; proper packaging and disposal of waste materials including hazardous materials; and leaving a work area clean and orderly. This includes office workstations and occupancies.
- One should plan work tasks before beginning work and consider any hazards that may exist and how to avoid them through proper work practices.
- One should keep an eye out for and take care of one’s “buddy” in the field.
- Obey all warning signs (e.g., “Do Not Enter,” “No Smoking,” “Eye, Hearing or Respiratory Protection Required,” “Permit Required Confined Space,” “Authorized Personnel Only”).
- Do not jump from any elevated surface or platform, including truck beds, equipment, and scaffolding.
- Taking shortcuts leads to injury. Use appropriate ladders, platforms, and stairs. Do not block, deface or remove any signage, barricade or fencing without approval.
- Keep passageways clean and clear of debris, materials, hoses, cords, and tripping obstructions. Items should be moved to low activity areas or overhead.
- Permits may be required when performing non-routine tasks and work involving hazards. Seek advice from the PM.
- Use only designated sanitary facilities.
- Be alert to work going on, around or above you including contractor activities and motoring public vehicles.

- Be familiar with project emergency procedures. Report all emergency situations to the PM immediately.
- Hand tools, electronic devices, and equipment may not be used for any purpose other than their intended use. Damaged equipment and tools with worn part(s) shall be reported to the Site Supervisor for repair or replacement.
- Electric power tools must be properly grounded or double insulated. Electric power tools shall be Ground Fault Circuit Interrupter-protected when use in wet and exterior conditions.
- Defective tools and equipment, frayed and ungrounded electrical cords and unguarded tools and machinery shall not be used. Report same to the Project Manager.
- Employees shall not remove floor covering, guardrails, or other working surfaces from any floor or perimeter side opening without approval by the PM.
- Defective or unsecured ladders shall not be used.
- Employees shall not ascend or descend a ladder without free use of both hands while facing the ladder.

#### **10.3.1 Housekeeping**

During site activities, work areas will be continuously policed for identification of excess trash and unnecessary debris. Excess debris and trash will be collected and stored in an appropriate container (e.g., plastic trash bags, garbage can, roll-off bin) prior to disposal. At no time will debris or trash be intermingled with waste PPE or contaminated materials.

#### **10.3.2 Smoking, Eating, or Drinking**

Smoking, eating and drinking will not be permitted inside any controlled work area at any time. Field workers will first wash hands and face immediately after leaving controlled work areas (and always prior to eating or drinking). Consumption of alcoholic beverages is prohibited at any AECOM site. Smoking, eating or drinking must be in an approved area.

#### **10.3.3 Personal Hygiene**

The following personal hygiene requirements will be observed:

Water Supply: A water supply meeting the following requirements will be utilized:

*Potable Water* - An adequate supply of potable water will be available for field personnel consumption. Potable water can be provided in the form of water bottles, canteens, water coolers, or drinking fountains. Where drinking fountains are not available, individual-use cups will be provided as well as adequate disposal containers. Potable water containers will be properly identified in order to distinguish them from non-potable water sources.

*Non-Potable Water* - Non-potable water may be used for hand washing and cleaning activities. Non-potable water will not be used for drinking purposes. All containers of non-potable water will be marked with a label stating:

***Non-Potable Water  
Not Intended for Drinking Water Consumption***

**Toilet Facilities:** A minimum of one toilet will be provided for every 20 personnel on site, with separate toilets maintained for each sex except where there are less than five total personnel on site. For mobile crews where work activities and locations permit transportation to nearby toilet facilities on-site facilities are not required.

Washing Facilities: Employees will be provided washing facilities (e.g., buckets with water and Alconox) at each work location. The use of water and hand soap (or similar substance) will be required by all employees following exit from the Exclusion Zone, prior to breaks, and at the end of daily work activities.

#### **10.3.4 Buddy System**

All field personnel will use the buddy system when working within any controlled work area. Personnel belonging to another organization on site can serve as "buddies" for AECOM personnel. Under no circumstances will any employee be present alone in a controlled work area. For areas not in controlled work areas, the procedures outlined in S3NA-314-PR, *Working Alone and Remote Travel* will be followed at all times.

#### **10.4 Safety Equipment Rules**

The following guidelines are provided that relate to safety equipment:

- Always wear assigned safety equipment and PPE.
- Always use protective equipment in accordance with manufacturer's instructions and company training and procedures.
- All employees, subcontractors, subconsultants, visitors, and vendors shall wear a hard hat, high visibility vest, sturdy work boots, and eye protection on projects. Other PPE may be required based on the nature of the work.
- Wear clothing suitable for the work being performed. Minimum attire consists of long pants and shirt with a minimum 4-inch sleeve, tank tops are not permitted unless otherwise specified.
- Hearing protection devices shall be used when conducting drilling operations.
- Fall protection equipment is required for all work with a fall exposure greater than 6 feet on any elevated structure or aerial platform including structural steel, incomplete work platforms, scaffolding, open surface work, and aerial lifts.
- Modification or alteration of any safety equipment is prohibited as it changes the equipment's design strength and manufacturer's certifications.
- PPE use shall be consistently enforced in accordance with rules established for the project and federal and state safety regulations.

#### **10.5 Work Ergonomic Rules**

The following guidelines are provided that address ergonomic issues:

- Use proper methods to perform all job functions so as to minimize the risk of physical injury.
- Take reasonable precautions when lifting heavy or large objects that could cause back injury or hernia.
- Do not exceed one's capability and strength. Seek assistance.
- Make suitable adjustments to one's workstation including office furniture, chair, keyboard platform, computer monitor for comfort, equipment, and work.
- Avoid routine, repetitive motion hand activities. Integrate varying motions and body parts.
- Change work routines e.g., phones, typing, files. Stretch and take mini-breaks.

## **10.6 Tailgate Meetings**

Prior to the commencement of daily project activities, a tailgate meeting will be conducted by the SSHO to review the specific requirements of this HASP and applicable AHA. Attendance at the daily tailgate meeting is mandatory for all employees at the site covered by this HASP and must be documented on the attendance form. All safety training documentation is to be maintained in the project file by the SSHO.

## **10.7 Hazard Communication**

Hazardous materials that may be encountered as existing on-site environmental or physical/health contaminants during the work activities are addressed in this SSHP and their properties, hazards, and associated required controls will be communicated to all affected staff and subcontractors.

In addition, any employee or organization (contractor or subcontractor) intending to bring any hazardous material onto this AECOM-controlled work site must first provide a copy of the item's Material Safety Data Sheet (MSDS) to the SSHO for review and filing (the SSHO will maintain copies of all MSDS on site). MSDS may not be available for locally-obtained products, in which case some alternate form of product hazard documentation will be acceptable in accordance with the requirements of S3NA-507-PR Hazardous Materials Communication.

All personnel shall be briefed on the hazards of any chemical product they use, and shall be aware of and have access to all MSDS.

All containers on site shall be properly labeled to indicate their contents. Labeling on any containers not intended for single-day, individual use shall contain additional information indicating potential health and safety hazards (flammability, reactivity, etc.).

## **10.8 Hazardous, Solid, or Municipal Waste**

If hazardous, solid, and/or municipal wastes are generated during any phase of the project, the waste shall be accumulated, labeled, and disposed of in accordance with applicable Federal, State, Provincial, Territorial and/or local regulations. Consult the Regional SH&E Manager for further guidance.

## **10.9 Stop Work Authority**

All employees have the right and duty to stop work when conditions are unsafe, and to assist in correcting these conditions as outlined in S3NA-002-PR, *Stop Work Authority for Unsafe Work*. Whenever the SSO determines that workplace conditions present an uncontrolled risk of injury or illness to employees, immediate resolution with the appropriate supervisor shall be sought. Should the supervisor be unable or unwilling to correct the unsafe conditions, the SSHO is authorized and required to stop work, which shall be immediately binding on all affected AECOM employees and subcontractors.

Upon issuing the stop work order, the SSHO shall implement corrective actions so that operations may be safely resumed. Resumption of safe operations is the primary objective; however, operations shall not resume until the Safety Professional has concurred that workplace conditions meet acceptable safety standards.

## **10.10 Client Specific Safety Requirements**

The client has specified no additional health and safety requirements.

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## 11 Site Control Measures

### 11.1 General

The purpose of site control is to minimize potential contamination of workers, protect the public from site hazards, and prevent vandalism. The degree of site control necessary depends on the site characteristics, site size, and the surrounding community.

Controlled work areas will be established at each work location, and if required, will be established directly prior to the work being conducted. Diagrams designating specific controlled work areas will be drawn on site maps, posted in the support vehicle or trailer, and discussed during the daily safety meetings. If the site layout changes, the new areas and their potential hazards will be discussed immediately after the changes are made. General examples of zone layouts have been developed for drilling activities and are attached to this section.

### 11.2 Controlled Work Areas

Each HAZWOPER controlled work area will consist of the following three zones:

- **Exclusion Zone (EZ):** Contaminated work area.
- **Contamination Reduction Zone (CRZ):** Decontamination area.
- **Support Zone (SZ):** Uncontaminated or “clean area” where personnel should not be exposed to hazardous conditions.

Each zone will be periodically monitored in accordance with the air monitoring requirements established in this SSHP. The EZ and the CRZ are considered work areas. The SZ is accessible to the public (e.g., vendors, inspectors). Example layouts of the work zones for drilling operation is presented in Figures 11-1.

#### 11.2.1 Exclusion Zone

The EZ is the area where primary activities occur, such as sampling, remediation operations, installation of wells, cleanup work, etc. This area must be clearly marked with hazard tape, barricades or cones, or enclosed by fences or ropes. Only personnel involved in work activities, and meeting the requirements specified in the applicable AHA and Sections 4 and 5 will be allowed in an EZ.

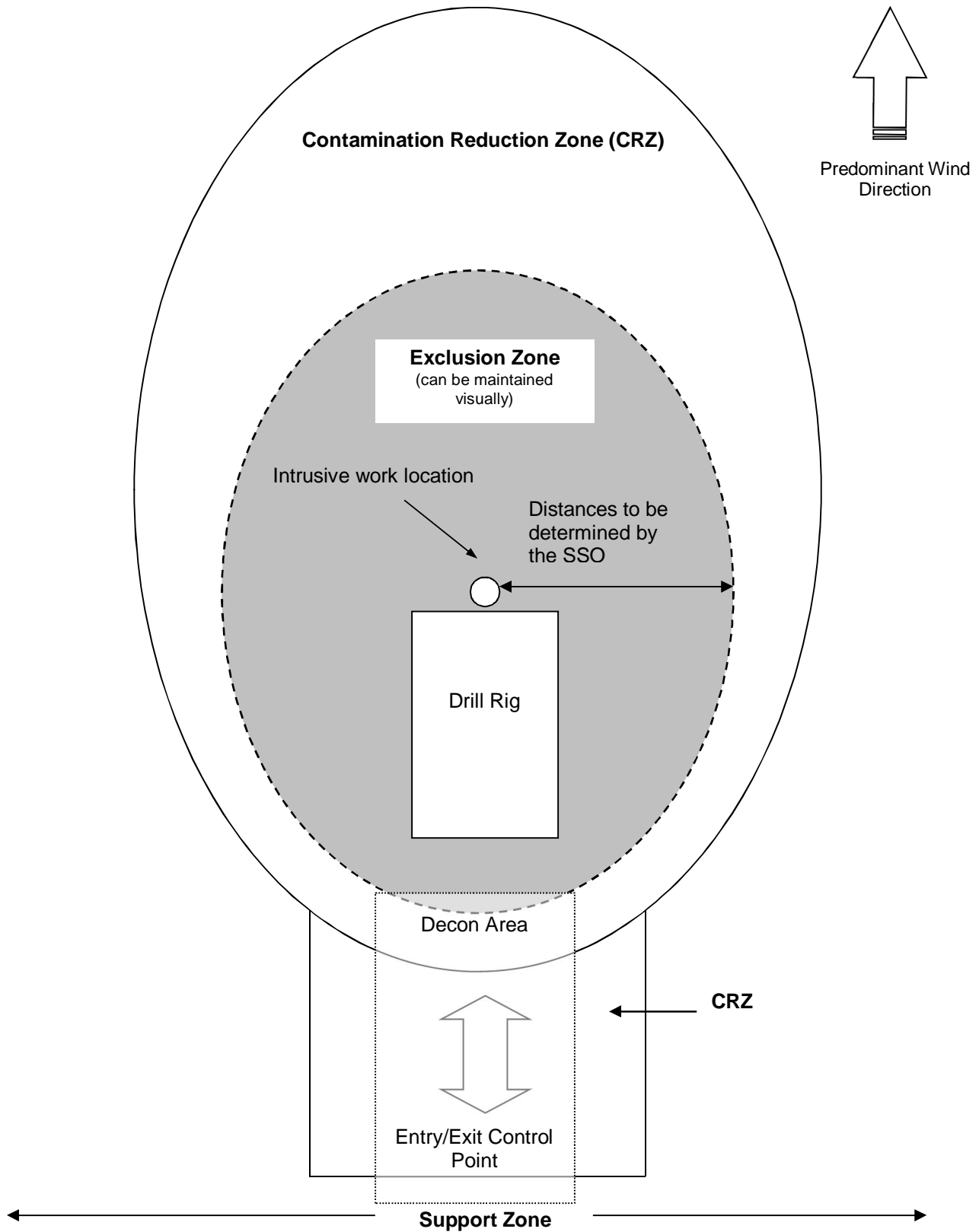
The extent of each area will be sufficient to ensure that personnel located at/beyond its boundaries will not be affected in any substantial way by hazards associated with sample collection activities. To meet this requirement, the following minimum distances will be used:

- **Drilling and Soil Sampling:** Determine the mast height of the drill rig. This height will be cleared, if practical, in all directions from the borehole location and designated as the exclusion zone. The cleared area will be sufficient to accommodate movement of necessary equipment and the stockpiling of spoils piles.
- **Groundwater Sampling:** A distance of 10 feet will be cleared in all directions from the monitoring well. The cleared area will be sufficient to accommodate sampling equipment and supplies.

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**Figure 11-1**  
**Example Drilling Site Control Layout**



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All personnel should be alert to prevent unauthorized, accidental entrance into controlled-access areas (the EZ and CRZ). If such an entry should occur, the trespasser should be immediately escorted outside the area, or all HAZWOPER-related work must cease. All personnel, equipment, and supplies that enter controlled-access areas must be decontaminated or containerized as waste prior to leaving (through the CRZ only).

#### **11.2.2 Contamination Reduction Zone**

The CRZ is the transition area between the contaminated area and the clean area. Decontamination is the main focus in this area. The decontamination of workers and equipment limits the physical transfer of hazardous substances into the clean area. This area must also be clearly marked with hazard tape and access limited to personnel involved in decontamination. Decontamination procedures are further explained in Section 12.

#### **11.2.3 Support Zone**

The SZ is an uncontaminated zone where administrative and other support functions, such as first aid, equipment supply, emergency information, etc., are located. The SZ shall have minimal potential for significant exposure to contaminants (i.e., background levels).

Employees will establish a SZ (if necessary) at the site before the commencement of site activities. The SZ would also serve as the entry point for controlling site access.

### **11.3 Site Access Documentation**

If implemented by the PM, all personnel entering the site shall complete the "Site Entry/Exit Log" located at the site trailer or primary site support vehicle.

#### **11.3.1 Visitor Access**

Visitors to any HAZWOPER controlled-work area must comply with the health and safety requirements of this SSHP and demonstrate an acceptable need for entry into the work area. All visitors desiring to enter any controlled work area must observe the following procedures:

- A written confirmation must be received by AECOM documenting that each of the visitors has received the proper training and medical monitoring required by this SSHP. Verbal confirmation can be considered acceptable provided such confirmation is made by an officer or other authorized representative of the visitor's organization.
- Each visitor will be briefed on the hazards associated with the site activities being performed and acknowledge receipt of this briefing by signing the appropriate tailgate safety briefing form.
- All visitors must be escorted by an AECOM employee.

If the site visitor requires entry to any EZ, but does not comply with the above requirements, all work activities within the EZ must be suspended. Until these requirements have been met, entry will not be permitted.

### **11.4 Site Security**

Site security is necessary to:

- Prevent the exposure of unauthorized, unprotected people to site hazards;
- Avoid the increased hazards from vandals or persons seeking to abandon other wastes on the site;

- Prevent theft; and
- Avoid interference with safe working procedures.

To maintain site security during working hours:

- Maintain security in the SZ and at access control points.
- Establish an identification system to identify authorized persons and limitations to their approved activities.
- Assign responsibility for enforcing authority for entry and exit requirements.
- When feasible, install fencing or other physical barrier around the site.
- If the site is not fenced, post signs around the perimeter and whenever possible, use guards to patrol the perimeter. Guards must be fully apprised of the hazards involved and trained in emergency procedures.
- Have the PM approve all visitors to the site. Make sure they have valid purpose for entering the site. Have trained site personnel accompany visitors at all times and provide them with the appropriate protective equipment.

To maintain site security during off-duty hours:

- If possible, assign trained, in-house technicians for site surveillance. They will be familiar with the site, the nature of the work, the site's hazards, and respiratory protection techniques.
- If necessary, use security guards to patrol the site boundary. Such personnel may be less expensive than trained technicians, but will be more difficult to train in safety procedures and will be less confident in reacting to problems around hazardous substances.
- Enlist public enforcement agencies, such as the local police department, if the site presents a significant risk to local health and safety.
- Secure the equipment.

## 12 Personal Hygiene and Decontamination

### 12.1 Personal Hygiene

Section 9.4 of the APP contains the site sanitation plan for the project.

### 12.2 Decontamination Requirements

All possible and necessary steps shall be taken to reduce or minimize contact with chemicals and contaminated/impacted materials while performing field activities (e.g., avoid sitting or leaning on, walking through, dragging equipment through or over, tracking, or splashing potential or known contaminated/impacted materials, etc).

All personal decontamination activities shall be performed with an attendant (buddy) to provide assistance to personnel that are performing decontamination activities. Depending on specific site hazards, attendants may be required to wear a level of protection that is equal to the required level in the EZ.

All persons and equipment entering the EZ shall be considered contaminated, and thus, must be properly decontaminated in the CRZ prior to entering the SZ.

Decontamination procedures may vary based on site conditions and nature of the contaminant(s). If chemicals or decontamination solutions are used, care should be taken to minimize reactions between the solutions and contaminated materials. In addition, personnel must assess the potential exposures created by the decontamination chemical(s) or solutions. The applicable MSDS must be reviewed, implemented, and filed by personnel contacting the chemicals/solutions.

All contaminated PPE and decontamination materials shall be contained, stored, and disposed of in accordance with site-specific requirements determined by site management.

#### 12.2.1 General Requirements

All possible and necessary steps shall be taken to reduce or minimize contact with chemicals and contaminated/impacted materials while performing field activities (e.g., avoid sitting or leaning on, walking through, dragging equipment through or over, tracking, or splashing potential or known contaminated/impacted materials, etc).

All personal decontamination activities shall be performed with an attendant (buddy) to provide assistance to personnel that are performing decontamination activities. Decontamination procedures may vary based on site conditions and nature of the contaminant(s). If chemicals or decontamination solutions are used, care should be taken to minimize reactions between the solutions and contaminated materials. In addition, personnel must assess the potential exposures created by the decontamination chemical(s) or solutions. The applicable MSDS must be reviewed, implemented, and filed by personnel contacting the chemicals/solutions.

All contaminated PPE and decontamination materials shall be contained, stored, and disposed of in accordance with site-specific requirements determined by site management.

#### 12.2.2 Decontamination Equipment

The equipment required to perform decontamination may vary based on site-specific conditions and the nature of the contaminant(s). The following equipment is commonly used for decontamination purposes:

- Soft-bristle scrub brushes or long-handled brushes to remove contaminants;

- Hoses, buckets of water or garden sprayers for rinsing;
- Large plastic/galvanized wash tubs or children's wading pools for washing and rinsing solutions;
- Large plastic garbage cans or similar containers lined with plastic bags for the storage of contaminated clothing and equipment;
- Metal or plastic cans or drums for the temporary storage of contaminated liquids; and
- Paper or cloth towels for drying protective clothing and equipment.

### **12.2.3 Personal and Equipment Decontamination**

All equipment leaving the EZ shall be considered contaminated and must be properly decontaminated to minimize the potential for exposure and off-site migration of impacted materials. Such equipment may include, but is not limited to: sampling tools, heavy equipment, vehicles, PPE, support devices (e.g., hoses, cylinders, etc.), and various handheld tools.

All employees performing equipment decontamination shall wear the appropriate PPE to protect against exposure to contaminated materials. The level of PPE may be equivalent to the level of PPE required in the EZ. Other PPE may include splash protection, such as face-shields and splash suits, and knee protectors. Following equipment decontamination, employees may be required to follow the proper personal decontamination procedures above.

Personnel decontamination should consist of the following glove removal procedure:

- Grasp the cuff of the dominant hand and pull glove over the bulk of the hand, leaving the fingers inside the glove;
- Use the dominant hand to grasp the cuff of the non-dominant hand and pull the glove completely off (inside-out) and place inside of the dominant hand glove;
- Once removed, employee should only touch the inside material of the dominant hand glove; and
- Thoroughly wash hands.

For equipment, a high-pressure washer may need to be used. Some contaminants require the use of a detergent or chemical solution and scrub brushes to ensure proper decontamination. Before heavy equipment and trucks are taken offsite, the Site Supervisor and/or SSHO will visually inspect them for signs of contamination. If contamination is present, the equipment must be decontaminated.

For smaller equipment, use the following steps for decontamination:

- Remove majority of visible gross contamination in EZ;
- Wash equipment in decontamination solution with a scrub brush and/or power wash heavy equipment;
- Rinse equipment;
- Visually inspect for remaining contamination; and
- Follow appropriate personal decontamination steps outlined above.

All decontaminated equipment shall be visually inspected for contamination prior to leaving the CRZ. Signs of visible contamination may include an oily sheen, residue or contaminated soils left on the equipment. All equipment with visible signs of contamination shall be discarded or re-decontaminated until clean. Depending on the nature of the contaminant, equipment may have to be analyzed using a wipe method or other means.

## 13 Emergency Equipment and First Aid

A complete first aid kit, Type III, 16 unit or larger in a waterproof container, and containing at a minimum, a one pocket mouthpiece for CPR, absorbent compresses, adhesive bandages, adhesive tape, antiseptic swabs, burn gel, sterile pads, and a triangular bandage will be readily available on-site. Its contents will be evaluated and possibly modified for this specific project. It will be located in the SZ.

The contents will be checked prior to their utilization for sterility and to replace expended items. The SSHO or other designated individual will inventory the kit weekly.

Prior to the start of work, the SSHO will discuss with site personnel the prevention steps, symptoms and medical persons available to assist with injuries or questions on diseases, plants or animals that could be encountered while working on this project.

A working cell phone and radio with adequate signal in this area will be maintained on-site and fully charged at the start of each work day.

A fire extinguisher will be readily available on-site. It will be located in the SZ, not more than 25 feet from the SZ activities. A minimum of a 5-lb. B: C fire extinguisher will be maintained in each vehicle as well. Personnel will be instructed on the proper use of fire extinguishers.

### 13.1 Emergency Supplies

At a minimum, the following supplies will be immediately available for on-site use:

- First aid equipment and supplies;
- Emergency eyewash station as per American National Standards Institute (ANSI) Z-358.1 if exposure to corrosive materials is present;
- Spill control material and equipment;
- Radio and cell phone;
- A minimum of two Type 10 A:B:C fire extinguishers;
- A vehicle parked at an exit point; and
- Each field team will have a first aid kit, eye wash, fire extinguisher, air horn, and communications equipment. Additional emergency response equipment will be located at the field office.

### 13.2 Accident Prevention Signs, Tags and Labels

Standard accident prevention signs, tags, and labels will be used to communicate hazards and precautions in accordance with Section 8 of EM 385-1-1. Examples that may be used include:

- Danger, Warning and Caution signs;
- Work zone signs;
- PPE requirement signs;
- Lockout/ tag out tags;

- Inspection and Do Not Use tags;
- NFPA or HMIS hazardous material signs and labels; and
- Specific items and quantities will be determined by SSHO.



## 14 Emergency Response and Contingency Procedures

AECOM personnel will follow the emergency response procedures established in Section 9.0 of the APP.

### 14.1 Emergency Response Plan

Although the potential for an emergency to occur is remote, an emergency response plan (ERP) has been prepared in accordance with SH&E SOP 203, *Emergency Response Planning* for this project should such critical situations arise. The only significant type of onsite emergency that may occur is physical injury or illness to a member of the AECOM team. The ERP will be reviewed by all personnel prior to the start of field activities.

Three major categories of emergencies could occur during site operations:

- Illnesses and physical injuries (including injury-causing chemical exposure);
- Catastrophic events (fire, explosion, earthquake, or chemical); and
- Safety equipment problems.

### 14.2 Emergency Coordinator

The duties of the Emergency Coordinator (EC) include:

- Implement the ERP based on the identified emergency condition;
- Notify the appropriate project and SH&E Department personnel of the emergency (Table 14-2);
- Verify emergency evacuation routes and muster points are accessible; and
- Conduct routine ERP drills and evaluate compliance with the ERP.

### 14.3 Site-Specific Emergency Procedures

Prior to the start of site operations, the EC will complete Table 14-1 with any site-specific information regarding evacuations, muster points, communication, and other site-specific emergency procedures. The emergency hospital route/detail map will also be included as Figure 14-1.

**Table 14-1  
Emergency Planning**

Emergency	Evacuation Route	Muster Location
Chemical Spill	Upwind	TBD
Fire/Explosion	Upwind	TBD
Severe Weather	Closest available shelter	TBD
Lightning	Closest available shelter	TBD
Additional Information		
Communication Procedures	Cell Phones	
CPR/First Aid Trained Personnel	TBD	
Site-Specific Spill Response Procedures	Use absorbents and spill kit for any incidental fuel spills from equipment	

**Table 14-2  
Emergency Contacts**

Emergency Coordinators / Key Personnel			
Name	Title/Workstation	Telephone Number	Mobile Phone
Mark MacEwan	Program Manager	(703) 739-4736	(202) 375-9353
Mike Myers	Project Manager	(301) 820-3246	(202) 746-8283
Brad Marschke	SSHO / Site Supervisor	(602) 648-2528	(480) 261-6966
Alberto Munuera	Regional SH&E Manager	(757) 408-4276	N/A
Incident Reporting	Incident Reporting Line	(800) 348-5046	N/A
TBD	DOT/IATA Shipping Expert	(804) 515-8506	(804) 640-4815
Organization / Agency			
Name			Telephone Number
Police Department (local)			911
Fire Department (local)			911
State Police			911
Ambulance Service (EMT will determine appropriate hospital for treatment)			911
Emergency Hospital (Use by site personnel is only for emergency cases)			(520) 327-5461
Hospital Information Tucson Medical Center 5301 E Grant Rd Tucson, AZ 85712			
WorkCare: 24-hr On-Call Occupational Nurse ( <i>minor First Aid assistance only</i> )			(800) 455-6155
Poison Control Center			(800) 222-1222
Pollution Emergency			(800) 292-4706
National Response Center			(800) 424-8802
Info-Trac: 24-hr Response Services– Account # 74984			(800) 535-5053
Title 3 Hotline			(800) 424-9346
Public Utilities			
Call Before You Dig			

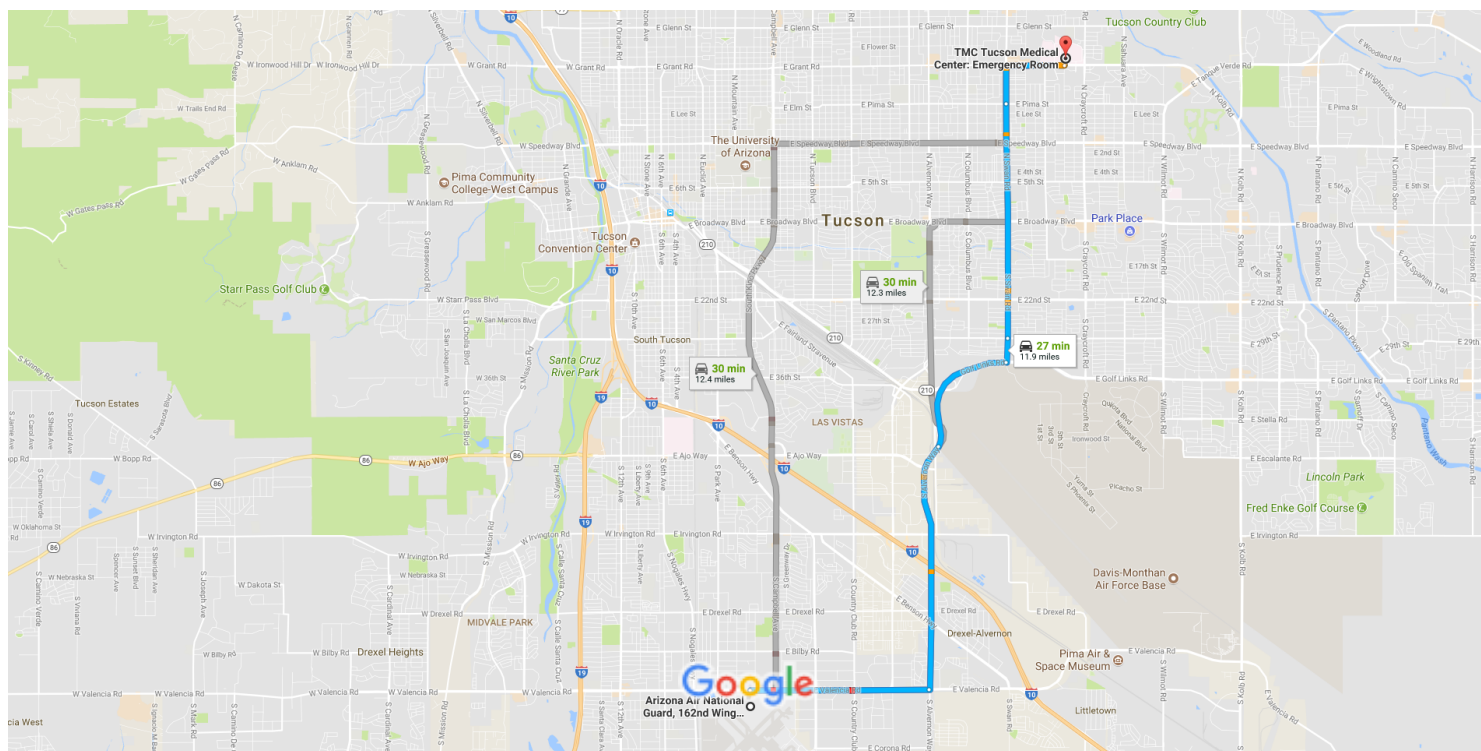
**Figure 14-1**  
**Emergency Hospital Route/Detail Map**

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Arizona Air National Guard, 162nd Wing,  
Tucson to TMC Tucson Medical Center: Emergency Room

Drive 11.9 miles, 27 min



Map data ©2017 Google United States 1 mi

## Arizona Air National Guard, 162nd Wing, Tucson

6620 S Air Guard Way, Tucson, AZ 85706


### Take E Valencia Rd, S Alvernon Way, Golf Links Rd and S Swan Rd to N Beverly Ave

27 min (11.8 mi)

1. Head east on E Valencia Rd toward S Campbell Ave  
2.3 mi
2. Use the left 2 lanes to turn left onto S Alvernon Way  
3.2 mi
3. Keep left to continue on Golf Links Rd  
1.7 mi
4. Turn left onto S Swan Rd  
0.3 mi
5. Continue straight to stay on S Swan Rd  
3.0 mi
6. Continue straight onto N Swan Rd  
0.5 mi
7. Turn right onto E Grant Rd  
0.8 mi

### Continue on N Beverly Ave to your destination

1 min (0.1 mi)

8. Turn left onto N Beverly Ave  
338 ft
9. Turn right  
 Destination will be on the right  
220 ft

## TMC Tucson Medical Center: Emergency Room

5301 E Grant Rd, Tucson, AZ 85712

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

## 15 Personnel Acknowledgement

By signing below, the undersigned acknowledges that he/she has read and reviewed the AECOM APP and SSHP for Fort Ritchie OU4. The undersigned also acknowledges that he/she has been instructed in the contents of this document and understands the information pertaining to the specified work, and will comply with the provisions contained therein.

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## **Attachment A**

### **Activity Hazard Analysis**

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## **Attachment B**

### **Material Safety Data Sheets (To Be Updated Prior to Operations)**

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## **Attachment C**

### **Equipment Safety Cards (To Be Updated Prior to Operations)**

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